

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

HAWAIIAN VOLCANO OBSERVATORY
SUMMARY 88 PART I
SEISMIC DATA, JANUARY TO DECEMBER 1988

BY
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CHRONOLOGICAL SUMMARY
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+ Arrived during 1988
* Left during 1988

INTRODUCTION

The Hawaiian Volcano Observatory (HVO) summary presents data gathered during the year, with a narrative highlighting seismic activity and a chronological narrative describing the volcanic events and significant Observatory-related activities. The seismic summary is offered without interpretation as a source of preliminary data. It is complete in the sense that all data for events of $M \geq 1.5$ routinely gathered by the Observatory are included. The emphasis in collection of tilt and deformation data has shifted from quarterly measurements at a few water-tube tilt stations ("wet" tilt) to a larger number of continuously recording borehole tiltmeters, repeated measurements at numerous spirit-level tilt stations ("dry" tilt), and surveying of level and trilateration networks. Because of the large quantity of deformation data now gathered and differing schedules of data reduction, the seismic and deformation summaries are published separately.

The HVO summaries have been published in various forms since 1956. Summaries prior to 1974 were issued quarterly, but cost, convenience of preparation and distribution, and the large quantities of data dictated an annual publication beginning with Summary 74 for the year 1974. Summary 86 includes an extensive description of the seismic instrumentation, calibration, and processing used in recent years. The present summary includes enough background information on the seismic network and processing to allow use of the data and to provide an understanding of how they were gathered.

A report tabulating instrumentation, calibration, and recording history of each seismic station in the network by Klein and Koyanagi is available as a USGS Open-File Report ¹. It is designed as a reference for users of seismograms and phase data and includes and augments the information in the station table in this summary.

SEISMIC ACTIVITY - 1988

Kilauea

Shallow, short-period earthquake counts, beneath Kilauea summit, averaged between 100 -200 per day. There was one prominent increase beginning in mid-April and continuing through most of May, associated with the eruption "shut off". Long-period activity, however, occurred in a more episodic fashion. Long-period events originating from shallow (LPC-A) and intermediate (LPC-C) depths peaked with above average daily counts during flurries lasting anywhere from a day to several tens of days. Notable flurries alternating between LPC-A and LPC-C were observed from mid-February through April (up to the eruption pause). Alternating flurries again were observed from mid-July through August. LPC-C events continued with cyclic high counts through November, while the LPC-A events relatively diminished. Because of poor onsets, only a fraction of detectable events were locatable. Seismicity along the southeast flank of Kilauea was relatively steady, with an average count of 50 to 75 events per day. A minor swarm on September 17 along the upper east rift peaked between 1200 to 1500 hrs. Episodes of deep tremor registered intermittently throughout the year but at a lesser rate during the last quarter.

Shallow eruption tremor continued throughout the year with low to moderate amplitude levels. Periods of low-amplitude tremor were accompanied by "gas-piston" activity associated with degassing and lava column collapse, most evident on the STC seismic station (located near Puu Oo). During the month of August, there were several rockfalls at Puu Oo and collapses of lava deposits at the sea coast. Starting from August 14 and increasing during the end of the month, a series of Puu Oo rockfalls occurred. A dust plume was observed as a result of a moderate rockfall on August 25 at 1211 hrs. A strong collapse near Kupapau Point registered at 0614 hrs on August 15. Explosive signals, characterized by monochromatic frequencies of 1.0 to 1.5 Hz, were recorded widely across

¹ Klein, F.W., and Koyanagi, R.Y., 1980, Hawaiian Volcano Observatory seismic network history, 1950-1979: U.S. Geological Survey Open-File Report 80-302, 84 p.

the seismic network and were strong enough to be processed for a reasonable location. Small to moderate rockfalls and collapses continued through the remainder of the year.

Mauna Loa

Activity for the Mauna Loa region was relatively uneventful. Daily summit counts were low except for a two-week period between late January to early February, when counts peaked to more than 70 on February 6. The Kaoiki and surrounding regions averaged approximately 20-30 events per day, most too small to process for hypocentral location.

Significant Events

Of the more than 2,300 events located during 1988 (Table 5), there were 251 earthquakes that scaled $M \geq 3.0$ (Table 6). Among them, 57 were $M \geq 4.0$, and 7 of the largest events ranged from 5.0 to 5.6 magnitude. On March 24 at 1429 hrs, a $M_a=5.0$ ($M_d=5.2$) earthquake marked the onset of a series of earthquakes, offshore approximately 50 km northwest of the Island of Hawaii. Over a hundred events were located during the series, which continued through April at a declining rate. Magnitudes ranged from approximately 1.4 to 5.6, with larger events reportedly felt on the Islands of Hawaii, Maui and/or Oahu. Other offshore activity included a mini-swarm on July 31 of moderate-sized earthquakes located south of Hawaii near Loihi. The swarm was most intense between 0358 to 0450 hrs. Several events were processed for location, the largest being $M_d=4.8$.

CHRONOLOGICAL SUMMARY - 1988

by

Thomas L. Wright

Staff. Ron Hanatani left the deformation program in May to return to school. Asta Miklius arrived in July to begin an appointment in the deformation program. Lynn Simmons, a summer NAGT student, continued on a temporary appointment. She expects to return to graduate school in the fall. Dallas Jackson retired at the end of the year, completing over 30 years of government service, half of which was spent at HVO. He will be replaced on the staff by Jim Kauahikaua.

Volcanic activity. Kilauea's eruption continued throughout the year at the Kupaianaha vent (table 1; fig. 1, 2). During a one-week pause, lasting from April 24 to May 1, the pond drained, the summit inflated, accompanied by shallow earthquakes, and the flow into the ocean stopped. Activity resumed quietly, tube systems were refilled, and the eruption continued as it had earlier in the year. This year, there was more explosive activity during lava entry into the ocean, which resulted in the formation and periodic destruction of littoral cones. The mode of formation of littoral cones was added to the lava tube studies as significant research efforts associated with the current eruption. Associated with the explosive activity was a new form of tephra called "limu o Pele" (Pele's seaweed) by local observers. The tephra is formed as ultra-thin sheets, originally up to 20 cm in maximum dimension, but quickly broken down into smaller, shiny flakes. Video documentation by John Kjargaard shows the mechanism of formation; apparently these are the result of the breakup of giant glass bubbles formed where water can interact with the lava fed by tubes into the ocean in spots protected from direct wave impact. The bubbles grow to several meters in diameter before they burst.

In June, a significant new volcanic hazard developed as the active bench growing into the ocean, collapsed catastrophically. These collapses were repeated at intervals of several days to several weeks throughout the remainder of the year. The collapses were associated with distinctive seismic signals recorded widely on the HVO net. Apparently the disappearance of the active bench is triggered by submarine collapse of the fragmental debris built up during the eruption. We suggest that the lava is entering the ocean onto steep, offshore topography that is unable to hold the growing fragmental lava pile. As a result of these collapses, there is significantly less new land created in 1988 than in 1987, even though lava entry into the ocean has been more sustained.

Puu Oo continued to collapse, enlarging its conduit from 25 m (July 1986) to over 250 m diameter by the end of the year. By mid-summer part of the original cone top was removed by collapse working its way up the side, although by the end of the year, there was still no measurable loss of altitude. It would appear that with continued incremental collapse, perhaps aided by a future strong earthquake, the Puu Oo cinder cone will be removed, leaving a lower structure with a broad summit crater, much like older structures on the rift zone, such as Puu Huluhulu and Kane nui o hamo.

Ground deformation. Details of the results of routine monitoring are given in Part II of this summary, which includes exciting results from evaluation of long-term deformation trends.

Other studies. Gravity studies were renewed at Kilauea with periodic occupation of a network of stations covering Kilauea's summit, rift zone, and mobile south flank. The gravity studies are designed to complement the long-term deformation measurements. Real-time picking and location software were completed in time for a meeting of the Seismological Society of America, held in Honolulu. Most earthquakes that trigger at least three stations are now located within about 30 seconds, and the location is displayed on the Amiga screen.

Table C-1.

Eruption statistics, 1988

Area

Total area covered by lava, January 1983 through December 1988 : approximately 62 sq km.

Surface area* covered by Puu Oo flows (episodes 1-47) plus the "A vent" flow of episode 48 :...36 sq km.

Surface area covered by Kupaianaha flows through December 1988 : approximately 26 sq km.

*Puu Oo flows originally covered about 42 sq km, but some of this area has been reburied by Kupaianaha flows.

New land created from December 86 through December 88 : roughly 72 acres. (This is a net figure, which does not include new land that was claimed by wave erosion or collapse of the active lava bench).

Volumes

Total, January 1983 through December 1988:	approximately	1000 million cubic meters
Episodes 1-47:		560 million cubic meters
Episode 48 (July 1986 through December 1988):	approximately	440 million cubic meters

Other fascinating facts

Kupaianaha pond diameter: roughly 120 m
 Pond level: 0-40 m below the northern rim
 Height of Kupaianaha lava shield: 60 m

Height of Puu Oo cone, October 1988: 253 m
 Diameter of Puu Oo crater: 200 m
 Depth of Puu Oo crater: about 180 m
 Puu Oo pond status: intermittently active

Structures destroyed

Residences destroyed through December 1988 : 64

Puu Oo

Episodes 1-47	Royal Gardens	16
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Kupaianaha

Nov 1986 - Dec 1987	Kapaahu, Kalapana, Royal Gardens	42
Jan - Feb 1988	Kapaahu, Royal Gardens	4
May 1988	Kapaahu	2

DEPARTURES

Name	Position
Ron Hanatani	Deformation
Gary Honzaki	Electronic
Dallas Jackson	Non-seismic Geophysics

ARRIVALS

Name	Position
Asta Miklius	Deformation
Lynn Simmons	Geology

Student appointments in 1988 were as follows:

Minority Program in the Earth Sciences (MPES):

Lureen Helliangao - Office/Library
Clayton Ishida - Shop
Jon Tokuuake - Computer/Deformation

Federal Junior Fellows:

Chad Okinaka - Seismology
Nicole Torres - Deformation

National Association of Geology Teachers:

Lynn Simmons - Geology
George Nibler - Geology
Elizabeth Eide - Geoelectric

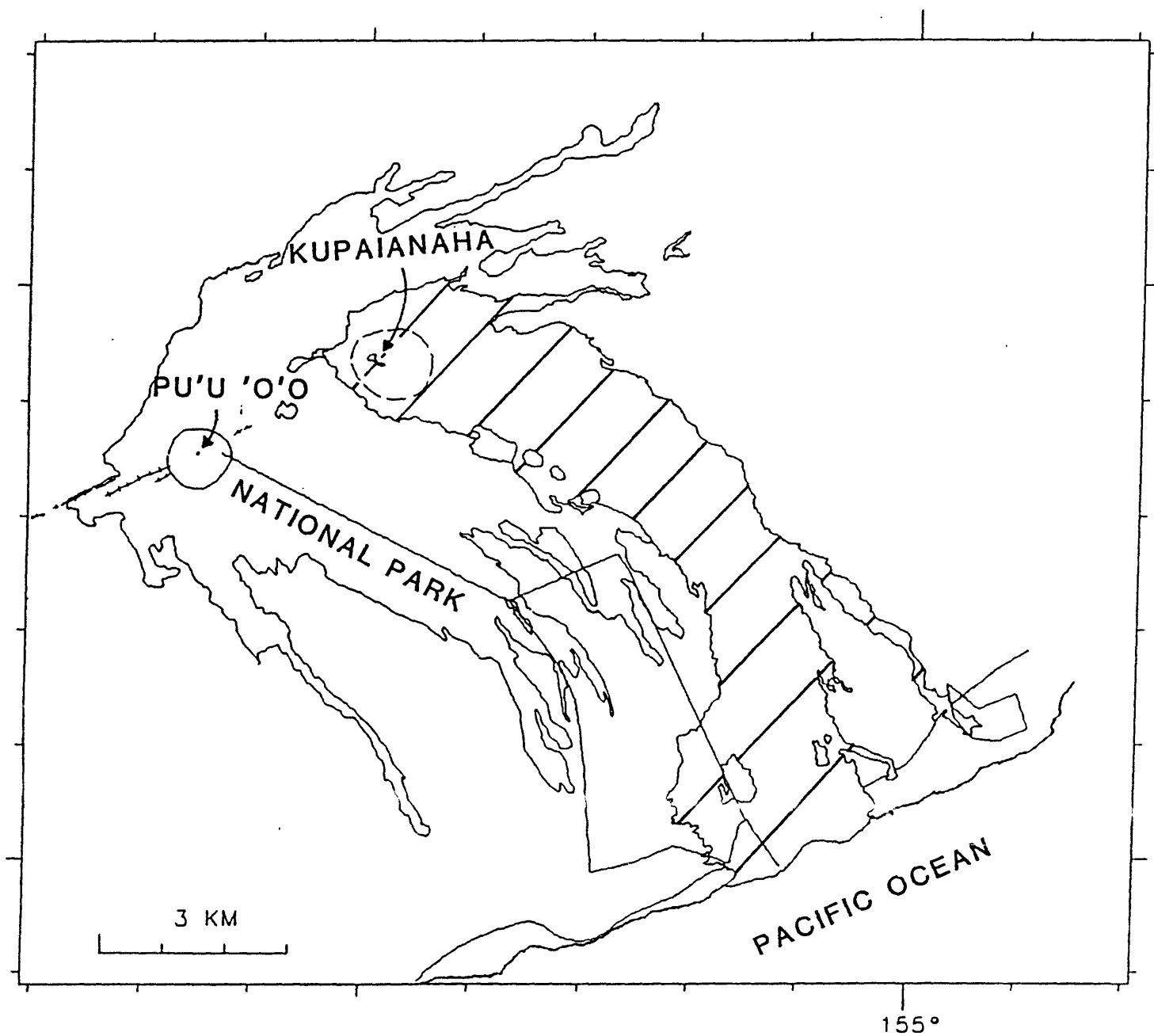


Figure C-1. Map showing area covered by lava from Kilauea's east rift eruption. Blank areas extending outward from Puu Oo are covered by lava erupted from January 1983 through July 1986. Hachured sections are covered by lava erupted from Kupaianaha from July 1986 to the end of 1988.

KILAUEA

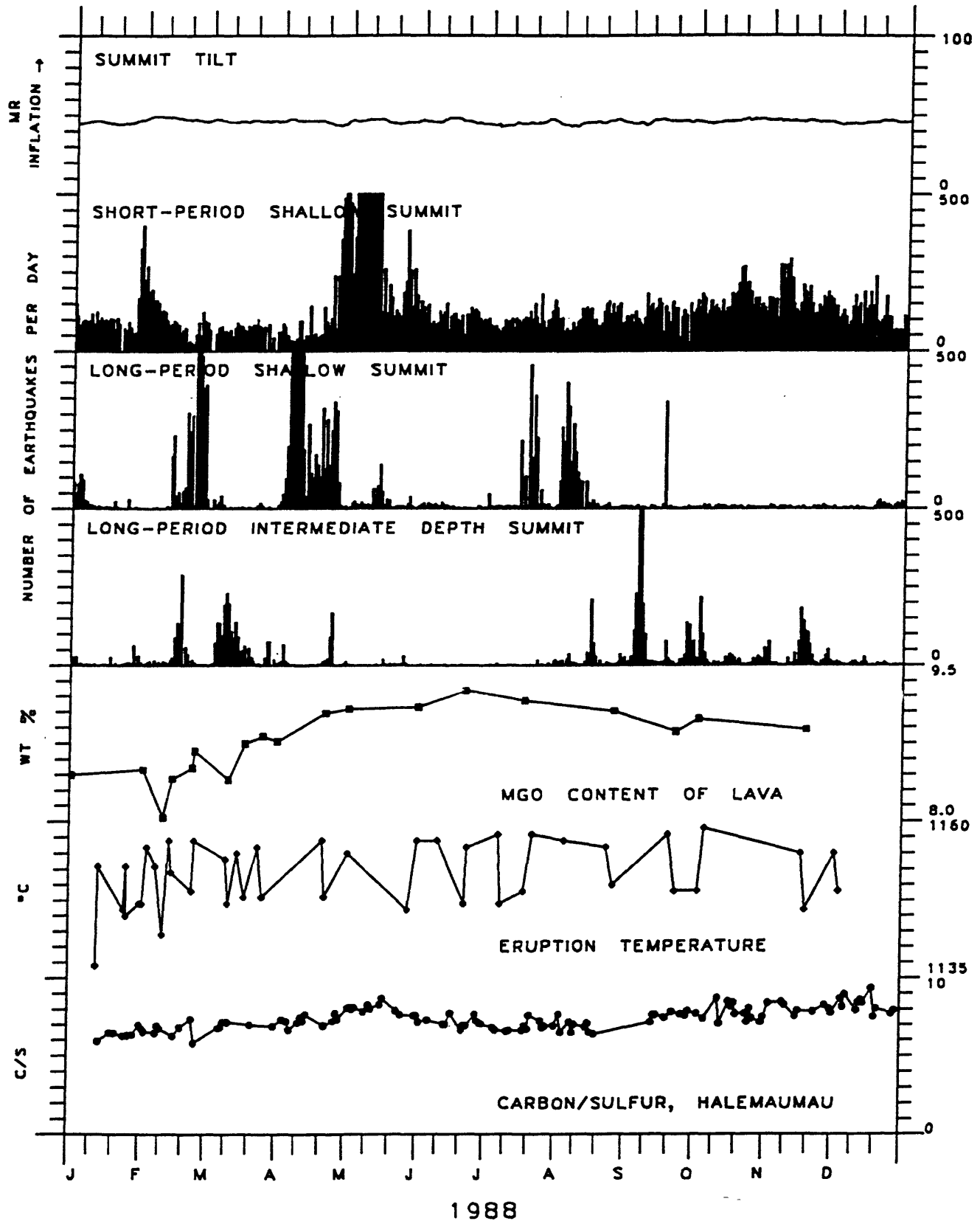


Figure C-2. Selected seismic, geodetic, petrologic and geochemical data for Kilauea, 1988.

SEISMIC INSTRUMENTATION

The network. The Hawaiian Volcano Observatory maintains an extensive telemetered seismic network on the Island of Hawaii. The 1988 network consisted of 51 stations-- 49 digital and 2 low-gain, three-component optical. The 49 digital stations include 12 three-component and 37 vertical-component sites. The coverage is most dense on and around Kilauea Volcano. With the exception of self-contained systems at the Uwekahuna and Hilo stations, all seismic signals from the short-period network are telemetered to the Observatory for recording.

Figure 1 is a map of selected geographic and geologic features, Figure 2 shows the seismic stations operated on the Island of Hawaii during 1988, and Figure 3 indicates the telemetry scheme for the respective seismic stations. Table 1 lists all seismic stations operated by the U.S. Geological Survey field office in Hawaii during 1988. Listed are names, four-letter station codes, coordinates in degrees and minutes, elevation in meters, and other data, as described below, pertaining to each station. In addition to the seismometers listed in Table 1, a long-period, three-component set of Press-Ewing seismometers was operated in the Uwekahuna vault and recorded on photographic paper.

Instrumentation and recording. Each telemetered station has a voltage-controlled oscillator (VCO) for FM multiplex transmission to HVO via either hardwire or radio. These telemetering stations are all of Type 1, the Office of Earthquakes, Volcanoes and Engineering (OEVE) standard system used in USGS seismic networks (see Table 2 for details). After discrimination at the receiver, the analog signals are converted to digital form as part of the routine computer location processing and archiving. Analog signals from 36 selected stations are recorded on two Develocorders using 16-mm microfilm. FM signals from the telemetering network are also recorded directly on one-inch magnetic tape. Selected larger events are copied onto condensed FM library tapes, which are currently archived in Menlo Park. The type(s) of continuous recording used for each station (in addition to magnetic tape for the telemetered stations) is coded in Table 1 as follows: D - Develocorder film, P - photographic paper, H - Helicorder paper, and I - ink paper.

In addition to the standard stations, optical drum seismographs are maintained at Uwekahuna (HVO), Hilo, Maui, and Oahu (Honolulu station operated by the Pacific Tsunami Warning Center). The less sensitive optical records are used primarily for amplitude measurements for magnitude calculations to supplement readings from the high-gain stations. The paper records, as well as the 16-mm Develocorder microfilms, are archived at HVO.

Seismograph response and calibration. Displacement response curves for the three short-period seismograph types in use are given in Figure 4. Types 2 and 3 are electro-mechanical systems recorded on paper records. The Type 1 curve gives the displacement magnification of the standard OEVE system from ground motion at the seismometer to the seismic trace, as seen on a 20x Develocorder film viewer. The curves plot the unit response, which is multiplied by a constant but known factor (CAL-factors range from about 1 to 7, averaging about 4, Table 1) to get the response for an individual station. Individual CAL factors for Type 1 seismographs are equal to the peak-to-peak amplitude measured in millimeters on the 20x Develocorder viewer of a 100-microvolt 5 to 8-Hz signal introduced to the preamp/VCO in place of the geophone at the field station. The calibration process is normally performed each time a station is visited when other maintenance is required.

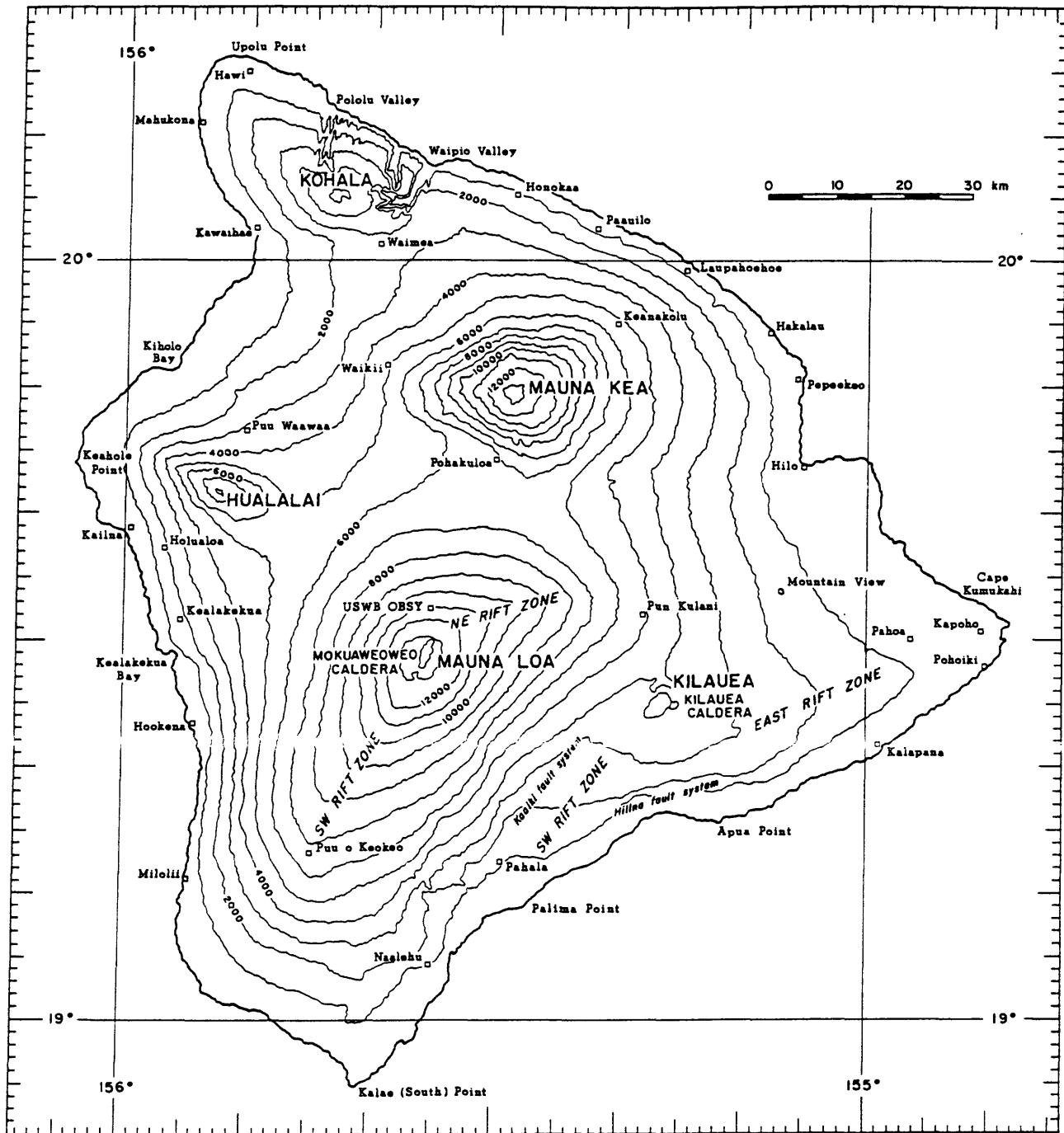


Figure 1. Map of the Island of Hawaii, showing principal settlements and selected geographic and geologic features.

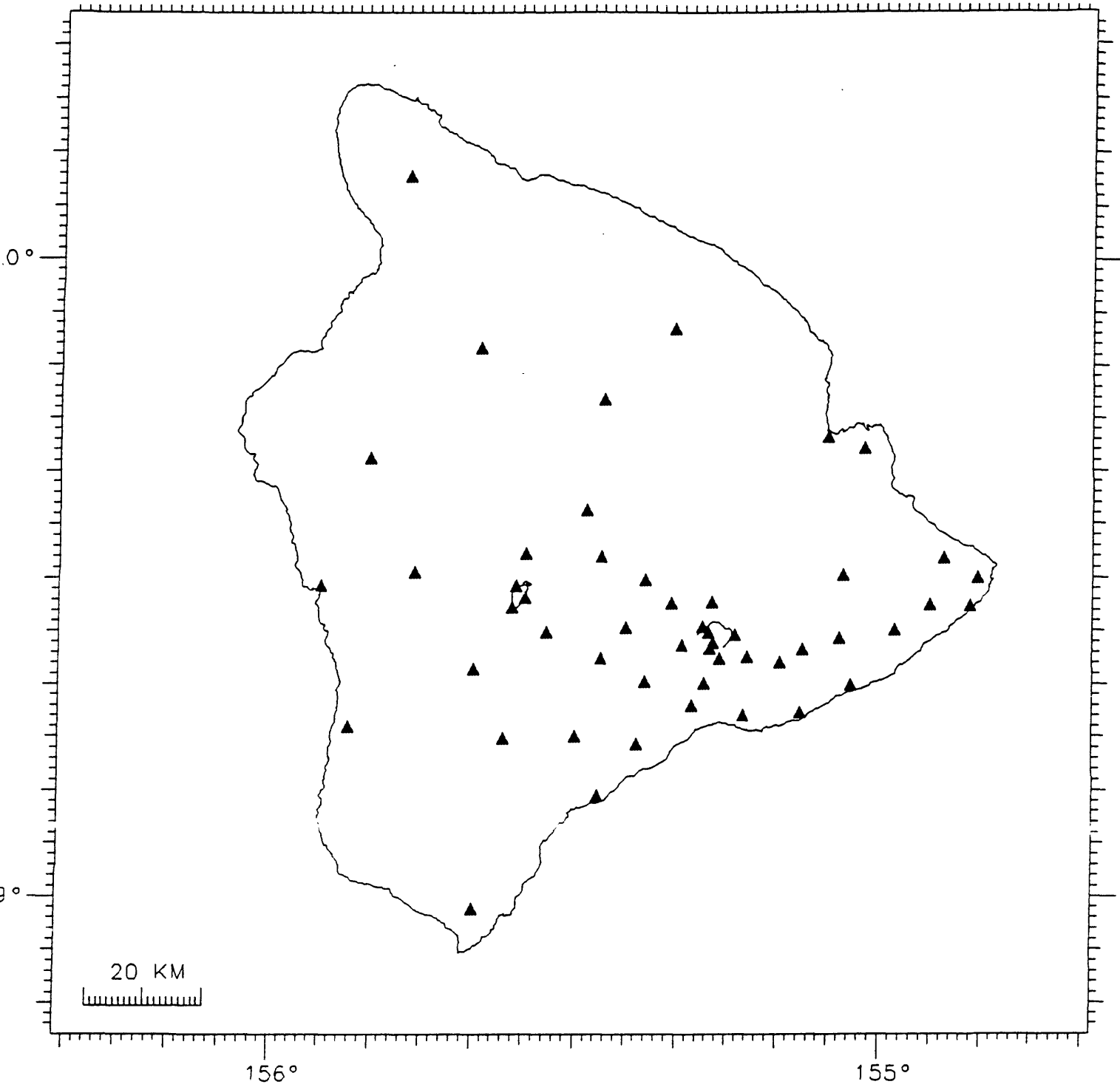


Figure 2. Seismic stations operational during 1988 on the Island of Hawaii.

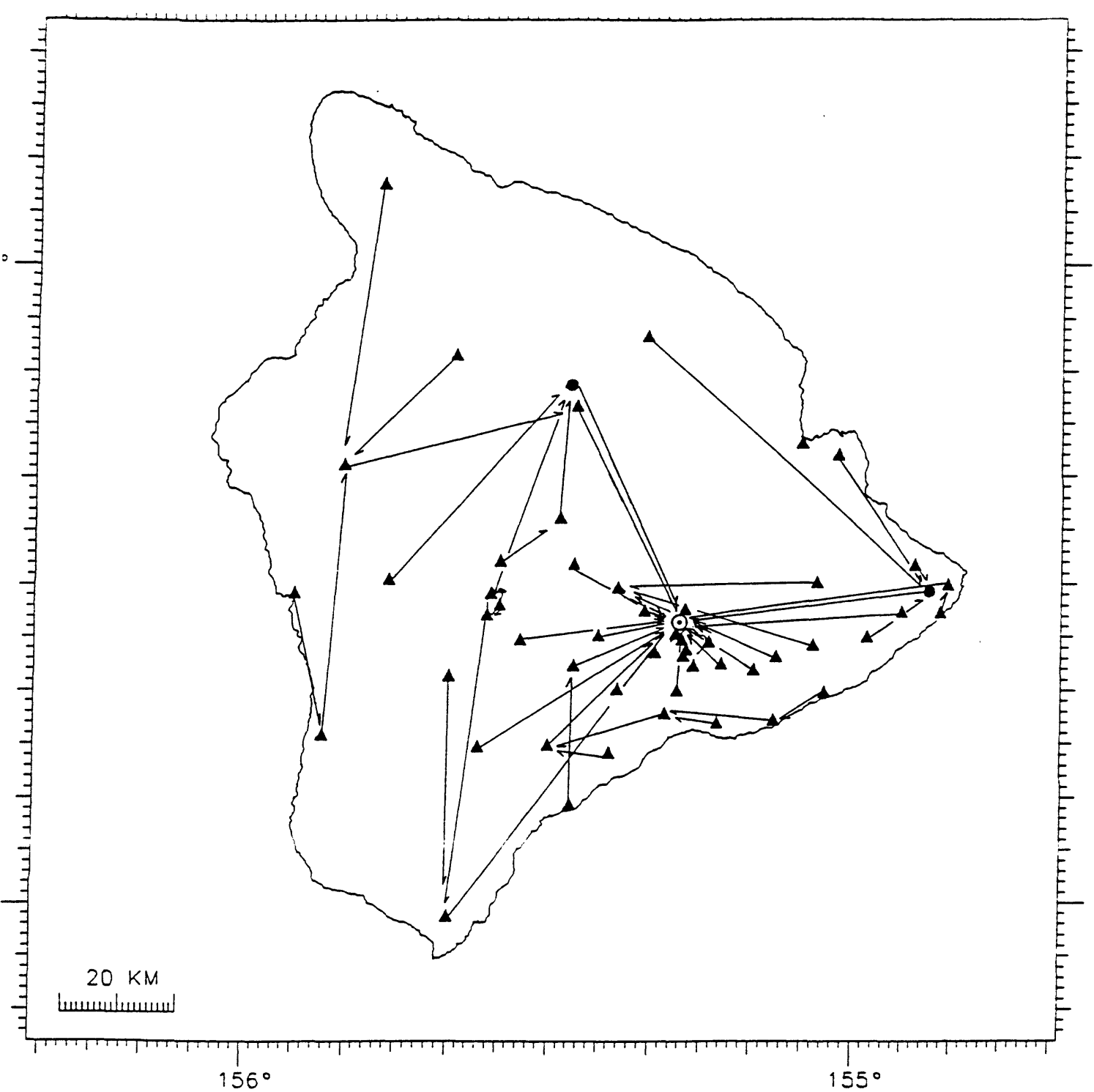


Figure 3. Telemetry scheme for the 1988 Hawaiian Volcano Observatory seismic network.

Legend

- △ Seismometer location
- Repeater station
- HVO

Table 1. Seismic stations in Hawaii operated by the USGS in 1988.

STATION NAME	CODE	--LAT--		---LON---		ELEV (M)	DELAY 1	DELAY 2	CAL	SEIS TYPE	OPTIC RECORD
		D	M	D	M						
AHUA	AHUV	19	22.40	155	15.90	1070	-0.10	-0.13	2.1	E4	DI
AHUA	AHUE	19	22.40	155	15.90	1070	-0.10	-0.13	3.0	MW	
AHUA	AHUN	19	22.40	155	15.90	1070	-0.10	-0.13	3.0	MW	
AINAPO	AINV	19	22.50	155	27.62	1524	0.13	0.17	5.5	L4	D
AINAPO	AINE	19	22.50	155	27.62	1524	0.13	0.17	3.0	MW	
AINAPO	AINN	19	22.50	155	27.62	1524	0.13	0.17	3.0	MW	
CAPTAIN COOK	CACV	19	29.29	155	55.09	323	0.00	-0.16	1.1	L4	D
CONE PEAK	CPKV	19	23.70	155	19.70	1038	-0.26	-0.07	6.0	L5	
DANDELION	DANV	19	21.42	155	40.04	3003	-0.27	0.03	7.0	E4	D
DESERT	DESV	19	20.20	155	23.30	815	-0.29	-0.13	3.0	L4	DI
ESCAPE ROAD	ESRV	19	24.68	155	14.33	1177	-0.17	-0.19	2.2	L5	D
HAWAIIAN BEACHES	HABV	19	31.89	154	53.89	92	-0.09	-0.24	1.0	L4	
HALEAKALA, MAUI	HAE	20	46.00	156	15.00	2090	0.00	0.00	1.0	W	P
HALEAKALA, MAUI	HAL	20	46.00	156	15.00	2090	0.00	0.00	1.0	H1	P
HALEAKALA, MAUI	HAN	20	46.00	156	15.00	2090	0.00	0.00	1.0	W	P
HILO	HIE	19	43.20	155	5.30	20	0.54	0.30	1.0	W	P
HILO	HIL	19	43.20	155	5.30	20	0.54	0.30	1.0	H1	P
HILO	HIN	19	43.20	155	5.30	20	0.54	0.30	1.0	W	P
HILINA PALI	HLPV	19	17.96	155	18.63	707	0.02	0.07	2.6	L5	D
HONOLULU, OAHU	HON	21	19.30	158	0.50	2	0.00	0.00	0.0	H1	H
HALE POHAKU	HPUV	19	46.85	155	27.50	3396	0.31	0.17	3.3	L4	D
HUMUULA SHEEP	STHSSV	19	36.31	155	29.13	2445	0.20	0.35	5.3	L5	D
HUMUULA SHEEP	STHSSE	19	36.31	155	29.13	2445	0.20	0.35	3.0	MW	
HUMUULA SHEEP	STHSSN	19	36.31	155	29.13	2445	0.20	0.35	3.0	MW	
HOT CAVES	HTCV	19	14.33	155	24.02	381	-0.16	-0.07	0.0	E4	
HUALALAI	HUAV	19	41.25	155	50.32	2189	0.67	0.38	3.0	L4	DI
HEIHEIAHULU	HULV	19	25.13	154	58.72	369	-0.17	-0.16	1.6	L4	DI
HEIHEIAHULU	HULE	19	25.13	154	58.72	369	-0.17	-0.16	3.0	MW	
HEIHEIAHULU	HULN	19	25.13	154	58.72	369	-0.17	-0.16	3.0	MW	
KAAPUNA	KAAV	19	15.98	155	52.28	524	-0.12	-0.01	3.5	E4	D
KAENA POINT	KAEV	19	17.35	155	7.95	37	-0.01	0.06	1.4	L4	D
KAOIKI FAULTS	KFAV	19	25.25	155	25.18	1579	0.13	0.17	0.0	E3	
KAHUKU	KHUV	19	14.90	155	37.10	1939	0.03	-0.03	2.7	E4	D
KANEKII	KIIV	19	30.56	155	45.90	1841	0.15	0.37	2.9	L4	D
KANEKII	KIIE	19	30.56	155	45.90	1841	0.15	0.37	3.0	MW	
KANEKII	KIIN	19	30.56	155	45.90	1841	0.15	0.37	3.0	MW	
KEANAKOLU	KKUV	19	53.39	155	20.58	1863	0.68	0.24	3.3	L5	D
KALALUA CONE	KLCV	19	24.35	155	4.08	659	-0.25	-0.30	0.0	L4	DH
PUU KALI	KLUV	19	27.48	154	55.26	271	-0.17	-0.30	2.9	L5	D
KOHALA	KOHV	20	7.69	155	46.77	1166	-0.03	-0.17	1.5	L5	D
KOHALA	KOHE	20	7.69	155	46.77	1166	-0.03	-0.17	3.0	MW	
KOHALA	KOHN	20	7.69	155	46.77	1166	-0.03	-0.17	3.0	MW	
KIPUKA NENE	KPNV	19	20.10	155	17.40	924	-0.11	-0.08	3.5	L5	D
KAPOHO	KPOV	19	30.02	154	50.51	134	-0.09	-0.24	2.5	L4	D
MAUNA LOA	MLOV	19	29.80	155	23.30	2010	0.03	0.08	5.8	L4	DI
MAUNA LOA	MLOE	19	29.80	155	23.30	2010	0.03	0.08	3.0	MW	D
MAUNA LOA	MLON	19	29.80	155	23.30	2010	0.03	0.08	3.0	MW	
MAUNA LOA X	MLXV	19	27.60	155	20.70	1475	0.06	0.15	3.0	L5	
MOKUAWEOWEO	MOKV	19	29.28	155	35.98	4104	0.15	0.16	5.5	L4	DI
MAKAOPUHI	MPRV	19	22.07	155	9.85	881	-0.17	-0.20	4.2	L4	DI
MOUNTAIN VIEW	MTVV	19	30.25	155	3.75	409	-0.02	0.01	5.0	E5	D
NATIONAL GUARD	NAGV	19	42.12	155	1.72	18	0.54	0.30	3.2	E5	D
NORTH PIT	NPTV	19	24.90	155	17.00	1115	-0.30	-0.18	3.0	E4	DI
NORTH PIT	NPTE	19	24.90	155	17.00	1115	-0.30	-0.18	3.0	MW	
NORTH PIT	NPTN	19	24.90	155	17.00	1115	-0.30	-0.18	3.0	MW	
OUTLET	OTLV	19	23.38	155	16.94	1038	-0.19	-0.18	4.9	L4	
PAUHI	PAUV	19	22.62	155	13.10	994	-0.21	-0.24	2.4	L4	D
PAUHI	PAUE	19	22.62	155	13.10	994	-0.21	-0.24	3.0	MW	
PAUHI	PAUN	19	22.62	155	13.10	994	-0.21	-0.24	3.0	MW	

PUU ULAULA	PLAV	19	32.00	155	27.67	2992	-0.03	0.13	5.4	L4	DI
POHOIKI	POIV	19	27.42	154	51.22	16	-0.09	-0.24	0.0	L4	
POLIOKEAWE PALI	POLV	19	17.02	155	13.47	169	-0.02	0.03	2.8	E4	D
PUU PILI	PPLV	19	9.50	155	27.87	35	-0.15	-0.15	1.7	E4	D
RIM	RIMV	19	23.90	155	16.60	1128	-0.21	-0.13	0.0	L5	
RAINSHED	RSDV	19	27.78	155	16.68	1270	0.06	0.15	0.0	L5	
SOUTH POINT	SPTV	18	58.91	155	39.92	244	-0.17	-0.22	2.8	L4	D
SOUTH POINT	SPTV	18	58.91	155	39.92	244	-0.17	-0.22	3.0	MW	
SOUTH POINT	SPTN	18	58.91	155	39.92	244	-0.17	-0.22	3.0	MW	
STEAM CRACKS	STCV	19	23.30	155	7.67	765	-0.25	-0.30	2.4	L5	DH
STEAM CRACKS	STCE	19	23.30	155	7.67	765	-0.25	-0.30	3.0	MW	
STEAM CRACKS	STCN	19	23.30	155	7.67	765	-0.25	-0.30	3.0	MW	
SOUTHWEST RIFT	SWRV	19	27.26	155	36.30	4048	0.01	0.04	5.6	E4	D
TRAIL	TRAV	19	24.91	155	32.96	3207	0.00	0.00	0.0	L4	
UWEKAHUNA	UEE	19	25.40	155	17.60	1240	-0.21	0.00	2.5	E	P
UWEKAHUNA	UEN	19	25.40	155	17.60	1240	-0.21	0.00	2.5	E	P
UWEKAHUNA	UEZ	19	25.40	155	17.60	1240	-0.21	0.00	2.5	E	P
UWEKAHUNA	URAV	19	25.40	155	17.60	1240	-0.21	0.00	0.0	RA	
UWEKAHUNA	URAE	19	25.40	155	17.60	1240	-0.21	0.00	0.0	RA	
UWEKAHUNA	URAN	19	25.40	155	17.60	1240	-0.21	0.00	0.0	RA	
WAIKII	WAIV	19	51.58	155	39.60	1433	0.20	0.35	0.0	L5	
WAHAULA	WHAV	19	19.90	155	2.92	29	-0.10	-0.04	1.5	E4	D
WILKES CAMP	WILV	19	28.15	155	35.02	4037	0.22	0.17	2.6	E5	D
WILKES CAMP	WILE	19	28.15	155	35.02	4037	0.22	0.17	3.0	MW	
WILKES CAMP	WILN	19	28.15	155	35.02	4037	0.22	0.17	3.0	MW	
WEATHER OBSERVAT	WOBV	19	32.31	155	35.01	3396	0.00	0.00	0.0	E4	
WOOD VALLEY	WOOV	19	15.08	155	30.12	909	-0.15	-0.06	4.6	E4	

Table 2. Seismic Instrument Types

The codes in parentheses refer to the seismometer types listed in Table 1.

Type 1 (Codes E, L, and 3, 4, 5) consists of:

- a) Geophone - Electrotech EV-17 (E), or Mark Products L4C (L) 1.0-sec. period moving-magnet vertical- or horizontal- (E-W and N-S) component seismometer adjusted for an output of 0.5 volts/cm/sec and 0.8, critically damped.
- b) Preamp/VCO - USGS/OEVE Model J302 (3), J402 (4), J502 (5) voltage-controlled oscillator. Three db points for bandpass filter at 0.1 Hz and 30 Hz. Signals are transmitted on audio FM carrier over cable or FM radio link to HVO.

Type 2 (Code E) consists of:

- a) Electrotech EV-17 1.0-sec. period moving-magnet vertical- or horizontal- (E-W and N-S) component seismometer.
- b) 3.5 Hz galvanometer with appropriate shunt resistances for critical damping. System is poorly calibrated. Peak magnification approximately 25,000 at 4 Hz.

Type 3 (Code H1) consists of:

Electrotech EV-17 or Observatory-built 0.8-sec. period moving-coil seismometer, with HVO-built solid-state seismic preamplifier, galvanometer driver, and 2 Hz galvanometer. Peak magnification approximately 40,000 at 4 Hz.

Code (W) is a Wood-Anderson torsion seismograph.

Code (MW) is a horizontal-component seismograph based on a Type 1 system and modified to a Wood-Anderson response.

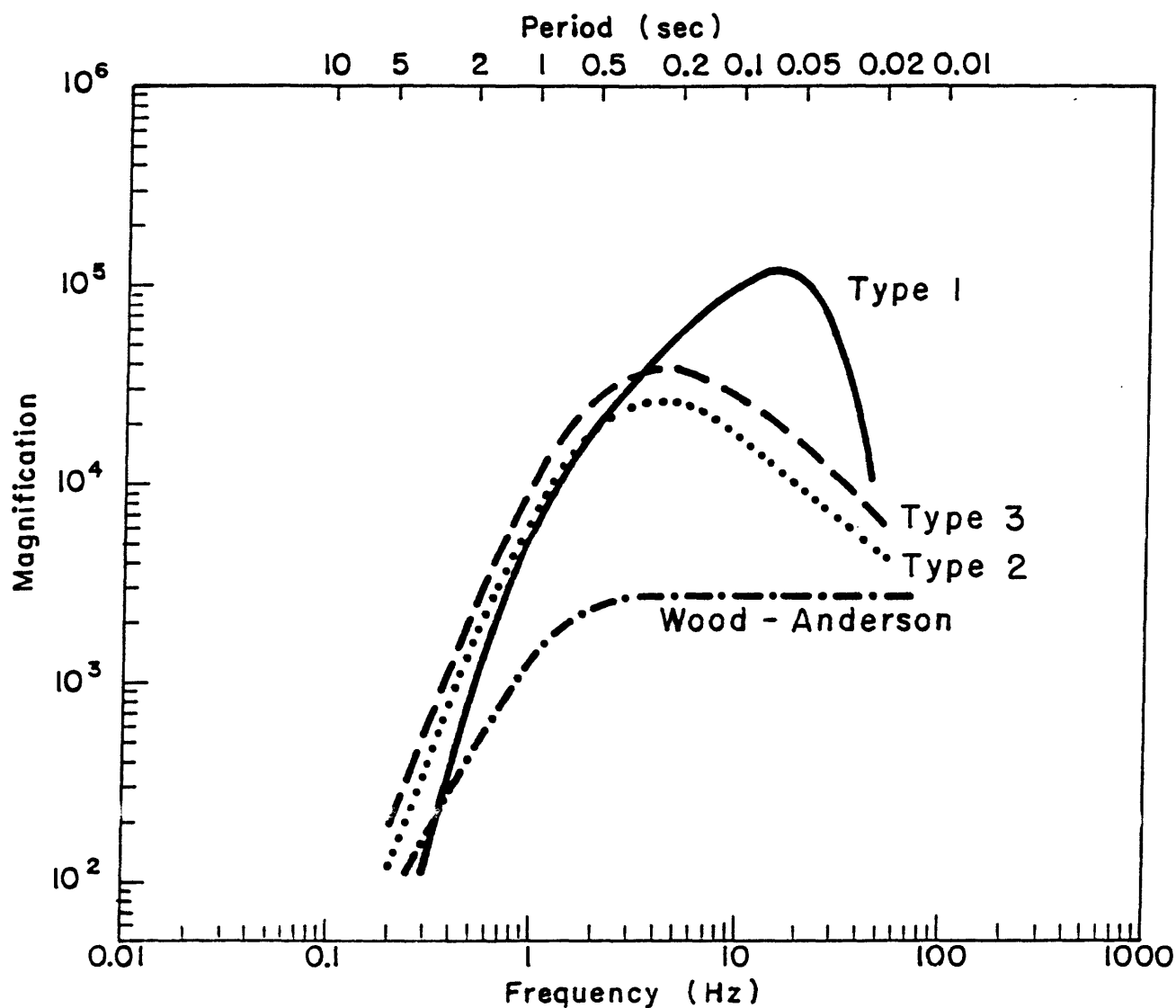


Figure 4. System response curves for the Wood-Anderson torsion seismograph and for the three different types of seismometers used by the Hawaiian Volcano Observatory. Types 2 and 3 are electro-magnetic seismographs recorded optically on photographic paper. Type 1 is the standard OEVE seismometer system recorded on Develocorder film and magnetic tape. The curve for Type 1 includes response of the geophone, all electronics including telemetry, Develocorder galvanometer, and projection of film by a 20x viewer. The curves plot the unit response, which should be multiplied by a constant but known factor (CAL) to get the response for an individual station.

SEISMIC DATA PROCESSING

Develocorder films are scanned on a daily basis for frequency of earthquakes, and coda duration in seconds are measured for magnitude determination. In 1986, HVO acquired a VAX 11-750 computer and adopted the CUSP (California Institute of Technology USGS Seismic Processing) routine. Discriminated analog signals are converted to digital form, and detected events are saved in real time. Detected events are demultiplexed, and P-picks are made by the computer, producing a rough location and coda-amplitude (CD) magnitude. Events are examined by an analyst to refine computer P-picks and to time additional P- and S-phases for a preliminary location. Binary CUSP files are tape-archived and translated into ASCII phase files. Locations are then determined, using the program HYPOINVERSE (Klein, 1989)². Events are reworked and rerun, as needed, to produce a final solution. Magnetic tape copies of all arrival times and output summary data are kept at Menlo Park and at HVO.

The crustal model used is specified by velocities at four depth points. Velocity at any depth is given by linear interpolation between points and uses a homogeneous half-space, as listed below:

VELOCITY (km/sec)	DEPTH (km)
1.9	0.0
6.5	4.6
6.9	15.0
8.3	16.5

Two empirical sets of station delays or corrections were used in the locations and are given in Table 1. The delay models are separated by a circle of radius 34 km, centered at 19°22' N and 155°10' W. Delay model 1 is used for epicenters occurring within a circle of radius 31 km from the center. This region includes Kilauea and its south flank. A combination of the two delay models is used for epicenters that fall in a transition zone that is 6 km wide. Delay model 2 is applied to the rest of the island and to offshore earthquakes. (For a detailed description, refer to Klein, 1989.)²

Magnitudes for most events are computed using both recorded amplitudes on low gain or Wood-Anderson stations and signal or coda duration on selected short-period vertical stations. Amplitudes read from other than Wood-Anderson instruments are corrected to an equivalent Wood-Anderson amplitude, using the curves of Figure 4 and CAL factors listed in Table 1. Amplitude magnitudes larger than 2.5 are generally based on the Wood-Anderson instruments in Hilo or on Type 2 seismographs at Uwekahuna.

Duration magnitudes are determined from the length of signal in seconds read from the Develocorder viewer. This length of time, also called the "F-P time," is measured from the P arrival to the point where the earthquake signal decays nearly to the noise level. A bilinear relation is an appropriate fit to the data sample and is used to compute all duration magnitudes. Duration times are read only from Type 1 seismographs. Because duration magnitudes are relatively insensitive to station response and can be determined using the high-gain, short-period stations, it is felt that duration magnitudes are more accurate and complete at the lower magnitudes (below 2). The equations used in magnitude determination are as follows:

$$\text{duration} < 210 \text{ sec} \quad M = -5.2 + 3.89 \log (F-P) + .013 Z - + .0037 D$$

$$\text{duration} > 210 \text{ sec} \quad M = -.905 + 2.026 \log (F-P) + .013 Z - + .0037 D$$

where Z and D are the depth and epicentral distance in km, respectively.

² Klein, F.W., 1989, User's guide to HYPOINVERSE: U.S. Geological Survey Open-File Report 89-314, 58 p.

SEISMIC SUMMARY

The emphasis in both station coverage and detailed data analysis is on the highly active south half of the Island of Hawaii. Hundreds of earthquakes too small to locate are classified as type³ and counted daily. The set of well-recorded earthquakes located in the Hawaii Island region is nearly complete above magnitude 2.0. Many smaller events are located in the densely instrumented Kilauea area. Substantial effort is made to locate earthquakes elsewhere within the Hawaiian Archipelago. Such coverage cannot be as complete as in south Hawaii, but nearly all events above magnitude 4.0 are located with limited precision. Data presented in the seismic summary are in four parts: (1) Table 3 gives duration of harmonic tremor and numbers of earthquakes (most too small to locate) from several source regions around Kilauea and Mauna Loa. The source region is determined visually from signal character and pattern of arrival times at key stations. (2) Maps showing computer-located hypocenters are given in Figures 9-22. The location maps are of different scales and provide hypocenters with magnitude thresholds set at 1.0, 2.0, 3.0, and 3.5, varying according to region. (3) The list of computer locations constitutes the bulk of this summary and is given in Table 5. Each earthquake in the list is assigned a three-letter code based on its general location and depth. Figures 5-8 are maps of the regions used to assign the location codes. The latitude and longitude limits of rectangular regions are listed in Table 4. When the listed coordinates overlap, precedence is given according to Figures 5-8. (4) Table 6 re-lists the events in Table 5 for which either duration or amplitude magnitude is 3.0 or larger. This list includes many of the earthquakes felt in Hawaii.

Table 3. Number of earthquakes and minutes of tremor recorded on seismographs around Kilauea and Mauna Loa.

Earthquake categories are as follows:

- 1) Kilauea summit, short-period caldera: shallow earthquakes beneath the caldera.
- 2) Kilauea summit, long-period caldera A: earthquakes characterized by low frequency signatures of 3 to 5 Hz, often originating 0-5 km beneath the summit.
- 3) Kilauea summit, long-period caldera B: earthquakes characterized by low frequency signatures of 1 to 3 Hz, often originating 0-5 km beneath the summit.
- 4) Kilauea summit, long-period caldera C: earthquakes characterized by low frequency signatures of 1 to 5 Hz, often originating 5-15 km beneath the summit.
- 5) Kilauea summit 30 km: earthquakes about 30 km deep beneath the summit region.
- 6) Koaiki and southwest rift: earthquakes beneath the southwest rift of Kilauea, western parts of the Koaie faults, and adjacent Koaiki fault system of Mauna Loa.
- 7) Upper east rift: earthquakes in the upper and middle east rift zones, the adjacent parts of the south flank, and eastern parts of the Koaie faults.
- 8) Lower east rift: earthquakes in the lower east rift zone and adjacent parts of the south flank.
- 9) Mauna Loa short-period: shallow earthquakes in the Mauna Loa summit region.
- 10) Mauna Loa long-period: earthquakes characterized by low-frequency signatures near the summit region.
- 11) Mauna Loa northeast rift: earthquakes beneath the northeast rift zone of Mauna Loa.
- 12-15) Tremor is separated into four categories: Kilauea--shallow, intermediate, and deep, and Mauna Loa. Depth is inferred on the basis of relative amplitudes on seismographs.

The criteria for Kilauea shallow tremor have been changed to accommodate the ongoing eruption where tremor in the middle east rift zone is continuous. Distinction is made between high-amplitude tremor related to strong eruptive periods and low-amplitude tremor during periods with no lava production. Only minutes of tremor at saturated levels recorded locally at STC and KLC are included in Table 3.

³ Koyanagi, R. Y., 1982, Procedure for routine analyses and classification of seismic events at the Hawaiian Volcano Observatory, Part I: U.S. Geological Survey Open-File Report 82-625, 32 p.; figs., 59 p. [unpaginated].

Table 3 KILAUEA SUMMIT KILAUEA FLANK MAUNA LOA TREMOR (MINUTES)

DATE 1988	SHORT PER. CALD.	LONG PER. A	PERIOD CALDERA B C	30 KM	KAO. & SW RIFT	UP. EAST RIFT	LOW. EAST RIFT	SHORT PER.	LONG PER.	NE RIFT	KILAUEA SHAL. INT. DEEP	MAUNA LOA
JAN 1	149	86	1	1	35	37	6	1				
2	112	48		26	17	38	1	1	3			
3	82	80		28	30	48	4	4		3		
4	94	110		1	30	31	3	8	2	5		
5	97	92		7	24	38	9	6	1	4		42
6	94	26		2	27	23	4		1	1		
7	96	22		4	26	41	2	5		4		
8	118	13		4	43	52	3	3		8		10
9	85	11		1	27	57	3	5	1	6		147
10	124	9			18	32	3	1				
11	96			5	28	40	2	4	2	5		
12	105	9			26	24	3			4		
13	96	4			14	15	3	3		2		27
14	99	2		2	25	32	4	4		1		
15	95	5		3	26	37	1	1		2		
16	104	5		4	29	46	3	6		3		4
17	102	5		2	35	20	3	5	1	7		
18	69			27	31	43	3			9		
19	106	24		2	37	29	6	5		2		
20	87	5		6	37	51	5	4	1	6		
21*												
22	71			1	34	43	1	1		2		53
23	66	1		5	26	49	4	2		4		
24	91			6	28	63	4	8		4		
25	75	30		9	35	67	7	7	1	6		
26	57			9	21	55		1		7		
27	60	1		5	24	44	2	2	1	4		
28	169	3		63	16	48	3	6	1	3		22
29	327	1		4	17	44	3	24		1		
30	399			30	24	73		30		1		
31	224	1		8	28	72	3	8		6		2
FEB 1	269				31	53	2	6		1		
2	189			5	47	77	2	10		9		100
3	194			10	37	63	1	7		9		16
4	161			14	36	71	4	10		4		29
5	161	2		2	48	51		30	1	3		3
6	152	3		15	22	47	8	72		5		
7	125	1		5	37	69	2	35		2		
8	128	1		9	26	59	9	16		4		42
9	124	1		5	27	66	4	27		9		
10	98	1		13	42	70	5	16		6		
11	83	7		9	28	69	6	2		18		
12	86	4		5	23	105	7	8		8		5
13	95	166		17	27	71	4	11		5		
14	90	233		24	35	41	4	6		1		
15	82	41		89	37	87	4	7		2		2
16	56	52		136	38	53	2	8	1	2		9
17	65	17		130	27	49	3	8		4		26
18	73	58		289	32	61	5	8	1	2	8	45
19	27	68			27	81	1	4		4		3
20	32	304		58	28	77	3	4		4		
21	24	244		35	34	56	5	2		7		
22*	21	296			10	30	6	2		2		
23	54	7		17	70	45	1	3	2	10		
24	90	496		8	63	60	5	13	5	6		

KILAUEA SUMMIT					KILAUEA FLANK			MAUNA LOA			TREMOR (MINUTES)		
DATE 1988	SHORT PER. CALD.	LONG A	PERIOD CALDERA B C	30 KM	KAO. & SW RIFT	UP. EAST RIFT	LOW. EAST RIFT	SHORT PER.	LONG PER.	NE RIFT	KILAUEA SHAL. INT. DEEP	MAUNA LOA	
FEB25	49	628		2	24	53	5	3	3	2			
26	123	485		3	39	54	8	4	2	1		26	
27	95	381		3	31	54	2	8		2			
28	89	392		1	40	55	3			2		2	
29	67	30		3	33	71	5	7	3	4			
MAR 1*	41				23	89	7	3		6			
2*				3	40	69	4	1		7			
3	55	29		7	32	53	3	2	2	8		4	
4	73	12		72	24	64	2	5		7	5	2	
5	78	20		135	37	52	3	4	1	8			
6	63	40		137	30	55	3	1	1	6			
7	63	12		96	35	60	4	2	4	11			
8	52	2		194	31	59	5	9	1	6			
9	66	1		231	23	50	3	2	4	3			
10	46	4		198	18	52	4	1		6			
11	73			111	24	45				6			
12	89	2		88	27	42	3	2		2			
13	80	3		138	44	68	4			12		45	
14	78	2		92	34	59	5	3		2	6		
15	66	5		45	26	58	3			10			
16	62	2		48	23	60	4	5		7			
17	78	1		61	31	104	1	2		3			
18	75	4		17	27	63	5	7	1	8		39	
19	83	2		55	42	70	7	7		4		36	
20	83			25	29	47	3	2	2	4		3	
21	99	4		13	36	53	5	3		20			
22	78	10		3	29	53	3	1		4			
23	73	18		5	48	59	3	1	4	3		7	
24	77	10		3	26	58	9		1	10		3	
25*													
26*	84			24	17	33		3		1			
27*	23	5		75	10	19	1	2		1			
28*	42	1		75	15	35	2			1			
29*													
30*	60	1		18	33	49		2		8	4		
31*	61	12		5	22	36		1		8			
APR 1	86	22		10	37	44	3		1	3		3	
2	75	47		12	34	46	3	2	1	10		8	
3	48	96		66	26	48	6	3		5			
4	34	196	1	13	20	57	1	2	1	8		72	
5	31	507		7	28	55	2			3			
6	30	526			25	45	1	1		11		25	
7	40	544		1	27	60	1	2	2	8			
8	95	1011		3	18	45	3	1	2	4		3	
9	94	537		1	25	54	3	3	1	5			
10	35	517		1	54	39	3	1	1	2		20	
11	49	188		2	25	41	4	2	1			30	
12	49	39			30	40	1	3		2			
13	143	268		1	27	39	1	4	2	5			
14	47	112		1	24	69	2	3	1	3			
15	55	97		3	21	60	5	3	1	8			
16	43	172		1	32	75	7	3		4			
17	48	141			22	40	4	1	-1	8			
18	52	99	5	1	22	46	2		1	6			
19	137	319	5	1	30	44	10	6		2			

KILAUEA SUMMIT					KILAUEA FLANK			MAUNA LOA			TREMOD (MINUTES)			
DATE	SHORT PER.	LONG PER.	PERIOD	30	KAO. & SW RIFT	UP. EAST RIFT	LOW. EAST RIFT	SHORT PER.	LONG PER.	NE RIFT	KILAUEA			MAUNA LOA
1988	CALD.	A	B C	KM							SHAL.	INT.	DEEP	
APR 20	91	126		12	25	52	5	2		9				
21	78	283		15	25	54	14	3		8				
22	103	137		20	21	57	6	1		4				
23	239	248		91	28	58	6	2	1	6		17		
24	69	335	3	169	20	52	5	4	1	2				
25	239	310		1	30	47	10	4		2				42
26	356	83		1	26	69	8	1	1	1				17
27	486	11		1	23	44	5	1		3				14
28	504	5		1	17	71	9		1	1				
29	549	7		5	34	68	4	1		2				5
30	471	1		13	28	83	9	5	2	3				
MAY 1	243	5		2	33	90	4							
2	360	18		2	41	69	12	14	1	1				13
3	593	24			29	61	10	2	3	4				4
4	675	15			22	75	4	5	3	1				
5	696	12			16	70	6	5	2	3				
6	583	21			24	56	8	2	2					
7	508	13			36	62	1	3	2	1				
8	930	10			22	52	3	5		1				
9	982	15			15	55		2	3	2				
10	1173	9	1	1	35	56	2	3		2				
11	1066	64			22	49	7	1	2	5				
12	982	41			30	58	5	2	1	5				
13	845	72		3	23	44	13	2		3				
14	123	140			30	47	7	3	1	3				
15	261	53			18	67	7	2	8	4				26
16	120	11		19	26	69	3	9		5		4		36
17	209	30		4	26	77	3	1		3				2
18	168	27			25	44	6	4		3				7
19	108	3		5	26	30	4	1	1	4				14
20	129	3		2	25	30	1	4		8				
21	117	6		5	49	7		1		5				
22	108	7		2	21	56	5			2				25
23	186	9		3	29	43	8	2		3				13
24	219	7		5	26	56	3	2	1					11
25	384	5		29	20	65	10	4	3	4				
26	257	16		7	26	43	10	1		3				
27	139	38			33	69	4	2	3	2				
28	260	7			31	59	3	1	1	1				
29	178	2			24	53	9	2	3	5				5
30	129	3			23	61	7	1		3				
31	158	8			39	75	9	5		7				3
JUN 1	139	14		3	28	57	4		1	6				
2	117	18			28	47	5		3	1				2
3	147	5			30	41	2	2	1	2				2
4	86	17			36	42	1		1					4
5	93	13			24	48	5		1					2
6	84	6		4	21	138	3	1	1	2				86
7	89	15			29	71	10		1	5				
8	126	8			32	68	4	4	1	7				
9	113	8			22	65	6		3	5				41
10	122	19			26	56	5		3	3				4
11	151	11			31	38	5			3				
12	67	12		4	25	60	10	4		2				
13	110	7			22	57	3	3	6	7				

KILAUEA SUMMIT					KILAUEA FLANK			MAUNA LOA			TREMOR (MINUTES)		
DATE 1988	SHORT PER. CALD.	LONG A	PERIOD CALDERA B C	30 KM	KAO. & SW RIFT	UP. EAST RIFT	LOW. EAST RIFT	SHORT PER.	LONG PER.	NE RIFT	KILAUEA SHAL.	MAUNA INT. DEEP	LOA
JUN 14	117	3			19	51	3	2		5			
15	120	7		1	28	52	6	2	3	5	14		
16	100	2		1	26	49	4	3	3	2			
17	93	3			30	50	14	3	2	3			
18	113	2			16	49	7	11	1	6		46	
19*	51			1	6	29	4		1	2			
20	117	3		2	31	57	4	1		3			
21	116				25	43	4			3		76	
22	137	2			28	46	10		1	3			
23	112	1		1	32	42	6		2	3			
24	131	1			17	41	9	3		1			
25	124	1			20	42	8			2		36	
26	102	8			20	60	1			4			
27	91	8		2	20	56	1	3	1	3			
28	101	2			31	69	10	1	1	3		10	
29	89	3			44	61	4	4		3			
30	104	2		1	24	49	11	3		3		3	
JUL 1	83	47			37	42	8	3		1			
2	74	7	2	3	34	37	7	1	1	1			
3	81			1	98	54	6		1	2		13	
4	68	8			42	64	3			7		2	
5	60	10		7	40	33	6	2		8			6
6	75	9			35	53	5			1			
7	99	2			38	48	5	2	2	4			
8	95	7			44	61	7	2		13		35	
9	96	10			41	72	5	2	1	3			
10	104	8		1	41	68	5	2		6		7	
11	72	4		1	300	48	3	2					
12	104	7			75	36	5	1		2		2	
13	98	5			41	50	3	6		9			
14	86	6		1	46	48	8			2			
15	101	216			48	44	3	3	3				
16	109	2			34	42	2	1		3			2
17	104	103		1	44	59	9	2	1	12		35	
18	125	4		1	34	44	7		1			5	
19	100	455		1	33	59	2	2		3			
20	150	162		1	33	42	5	3	2			4	
21	107	358			41	67	3	5		3			
22	86	225			33	65	6	5		3			
23	181	11		15	33	64	7	2		10			
24	94	59		1	27	84	5	1		1		8	
25	73	13	2	3	32	68	8	4	2	4			
26	97	5			38	47	2	2		1		24	
27	102	15			24	35	7	4					
28	127	3	1	6	28	53	7		1	6			
29	160				35	48	5	2	3	1		8	
30	137	3		13	37	48	8	4	1				
31	102	11		18	38	47	3	3		7			
AUG 1	106	88		11	37	95	2	4	1	5		41	
2	63	233	25	14	33	74	2	1		2			2
3	71	212		15	31	57	4	6		2		9	
4	64	400		1	29	36	4	1		1			
5	66	324		22	40	54	5		1	3			
6	90	148		37	33	67	3	1	2	1		52	
7	74	270		10	30	52	5	2	2	3		2	

KILAUEA SUMMIT					KILAUEA FLANK			MAUNA LOA			TREMOR (MINUTES)		
DATE	SHORT PER.	LONG PER.	PERIOD	30	KAO. & SW RIFT	UP. EAST RIFT	LOW. EAST RIFT	SHORT PER.	LONG PER.	NE RIFT	KILAUEA		MAUNA LOA
1988	CALD.	A	B C	KM							SHAL.	INT.	DEEP
AUG 8	94	180	10	1	41	61	5			1			
9	101	116	7		48	43	6	1	4				3
10	134	88	2		46	49	6	1	4	5	2		22
11	127	87	3		30	45	6		1	1			
12	139	1	1	1	37	69	3		4	1			31
13	130	86	13	1	33	80	5	4		2	6		
14	135	17	42		21	125	3	2	1	3	8		3
15	98	6	21	1	22	74	11	3	1	1			
16	101	27	211		21	77	8			3			
17	81	10	71		24	65	7	1		4	2		
18	81	14	29		23	41	10	1		1			
19	89	3	4		32	47	8	4	1				
20	125	5	16		21	81	6	6		1	3	11	3
21	152	7	2	1	23	59	4	1		6			
22	157	12	1		44	76	6	3	4	3			
23	116	18	9		26	51	4	1		4			
24	148		6		40	63	4	5		3			
25	120	3	3		20	62	1	1		3			10
26	141	4	4		27	50	1			5			
27	152		5	2	27	79					4		
28	87	5	9		21	48	5			3			
29	90	9	35	1	56	52	8	1		2			
30	110	8	15		27	43	7		1	1			4
31	108	6	25		36	57	12	2	2	2			2
SEP 1	115	5			48	48	9	3		1	3	26	
2	89	9	14		34	54	7	5	1	3			5
3	125	3	29		46	59	6	1		1			
4	101	5	112		42	44	10	1		4			3
5	89	11	231		45	81	6	2		3			
6	91	4	750		36	48	2	2					33
7	105	5	703	1	38	58	5	2		4			
8	182	5	197		28	72	4	3			3		
9	138		100	1	31	70	11	2		4			
10	149	1	14	2	26	90	4	1		6			
11	123	10	12		33	75	5	1		10			4
12	134	8	13		47	89	4	2	1	16			11
13	163	2	10		23	68	2	1	1	3			5
14	150	2	9		40	63	5	8		4			
15*	60	1	6	1	23	32		3	2	2			
16	140	13	10		31	83	6	2		5			
17	121	338	12		29	2062	8	2		1			
18	90	3	78		27	79	6	3	1	5			
19	156	7	22		40	101	18	9					6
20	135	2	12		45	92	6	4	1	7			
21	134	3	10		33	78	4	1		2			
22*	42				6	10	2	1					
23	108		3		32	64	3	4		1	2		
24	128	1	18	2	17	54	6	6		6			
25	115	3	20		39	49	3	1	2	8			
26*	26	1	34		15	18		3		2			
27	150	8	136		30	83	1	4	1	6			
28	120	4	129		34	60	5	2		8			
29	131	4	71		44	109		2	2	1	3		
30	160	3	79		34	68	5	4		18			
OCT 1	135	3	22		55	67	8	5	1	3			

KILAUEA SUMMIT					KILAUEA FLANK			MAUNA LOA			TREMOR (MINUTES)		
DATE 1988	SHORT PER. CALD.	LONG PERIOD A	CALDERA B C	30 KM	KAO. & SW RIFT	UP. EAST RIFT	LOW. EAST RIFT	SHORT PER.	LONG PER.	NE RIFT	KILAUEA SHAL. INT. DEEP		MAUNA LOA
OCT 2	180	5		21		34	64	5	5		3	3	
3	169	4		217		37	80	7	4	1	2		15
4	114	10	3	101		23	74	7	2		2		
5	127	5		41		38	57	2	2		5		5
6	159	12		16		31	60	5	2		3		
7	138	1		5		26	61	10	3				
8	145	1		2		35	69	5	3	1	3		
9	133	3	4	11		22	55	11	4		2		
10	122	11		8	1	28	84	8	6		4		12
11	161			9	2	27	56	6					15
12	123	8	2	4		26	70	14			1		
13	136	6		6		23	60	7		2	4		
14	138	3		27		30	51	6	4		6		19
15	184	1		12		37	101	6	3		4		42
16	177	7		35		30	66	5	7			5	
17	185	6	1	30	2	37	68	1	3	4	5		
18	213	5		21		56	74	5					
19	265	5		8		30	60	6	3		1		
20	269	5		19	2	26	70	9	2	1	1		
21	200			1	1	36	56	1			6		
22	217			3	4	14	59	3	2		6		
23	188	6		2		21	71	5	2		14		
24	143	2		5		26	78	7	1	2	2		34
25	167	5		6		23	94	8	8		2		
26	167	4		22		36	63	8	3				
27	132	3		7		32	65	9		1	2		
28	148	3		29		38	56	10	4		3		
29	138	3		23		35	53	5	4		1		
30	121	4		6		26	60	6	2	1	4		
31	169	4		55		31	58	9	2			4	20
NOV 1	167	2		16		31	62	9	2	1	3		5
2	154	11		75		40	70	10	3	1			
3	166	7		7		23	72	7	1		1		4
4	102			5		10	22		1				
5	276			7		27	62	1	1				10
6	275	6		1	1	25	64	7	1				
7	227	6		2		17	47	4	1				
8	276	6				19	37	7	2	1			17
9	294	3		2		28	53	7			1		
10	231	6		23		20	53	3			6		
11	148	4		7		39	39	11	2		2		
12	130	2		7		30	60	2			4		18
13	121	4		38		24	53	5	1				7
14	151	5		12		28	55	6	5	1	1		
15	208	2		78		25	42	6	2				
16	188	7		181		31	65	3	6		3		
17*	164	2		143		14	43	6	2		5		40
18	204			109		18	71	1	1	1	1		
19	148			105		30	49	4	1	1	1		4
20	114	1		67		20	39	10			3		3
21	120	6		31	1	28	37	8	2	2	1		
22	146	6		10	1	22	43	11	1		2		
23	134	8		6		27	44	7	2		1		
24	173	3				29	40	9	1		2		
25	167	13		14		27	64	6	4				

KILAUEA SUMMIT					KILAUEA FLANK			MAUNA LOA			TREMOR (MINUTES)		
DATE	SHORT PER.	LONG	PERIOD	30	KAO.	UP.	LOW.	SHORT	LONG	NE	KILAUEA		
1988	CALD.	A	B C	KM	& SW	EAST	EAST	PER.	PER.	RIFT	SHAL.	INT.	DEEP
NOV26	187	7	18	2	51	57	4	5		2			
27	171	5	32	1	34	68	11	1		5			
28	164	3	51		26	43	7	2	1	1			
29	143	3	15	1	38	58	5	1	2	2			
30	142	6	10		32	52	9		1	2			
DEC 1	104	1	10		27	49	7	6		5			
2	115		12		56	52	6		2	4			
3	129		8		26	66	1	2	2				
4	109	4	4		33	47	6	5		2		3	8
5	80	3	4	1	15	76	3	2					
6	92	1			32	50	4	1		5			
7	139	4	1	2	38	56	4	3					
8	177	4	6	1	31	43	9	1		1			
9	137	2	13		26	56	10					9	
10	151	7	14		30	53	7	3	2	2			
11*	82	1	7		18	28	3		1	1			
12	188	4	2		33	43	8	4	1	5			
13	131	3	9		34	68	8	2	1		8	9	
14	142		26	2	42	59	2	1		2			
15	189		9		31	62	2	2		2			
16	144		1		38	61	3	1		2			
17	238		2		33	41	3			3			
18	95	7	2	1	22	44	1						
19	87	20		1	27	44	6	1		1		16	
20	97	26	6		26	46	7	1		1		11	
21	108	10	3		31	59	5	3		1			
22	175	18	5	3	15	49	6	2		3			
23	109	8	9		33	80	4	1	2	2			
24	107	13	5		20	43	2	2					
25	65	7			23	35	3	2	1				
26	68	2		1	32	35	9	3				10	
27	67	13	2		31	52	4	2	1	1			
28	68	19	3		27	52	4	1		1			
29	65	7	1		21	35	4	1		1			
30	112	23	3		10	47	2	1	1	3			
31	86	11	1	1	14	58	4			3			

*Data incomplete - station(s) or recorder not in operation.

Table 4. Names and coordinates of regions used for classifying earthquakes.

All earthquakes locate in one of the following groups, identified by a numerical class or three-letter code:

Shallow:

- 1 SNC - Shallow north caldera (0-5 km)
- 2 SSC - Shallow south caldera (0-5 km)
- 3 SEC - Shallow east caldera (0-5 km)
- 4 SER - Shallow east rift (0-5 km)
- 5 SME - Shallow middle east rift (0-5 km)
- 6 KOA - Koaie fault zone (0-5 km)
- 7 SSF - Shallow south flank (0-5 km)
- 8 SLE - Shallow lower east rift (0-5 km)

Intermediate depth:

- 9 SF1 - Kilauea south flank (5-13 km) (west end)
- 10 SF2 - Kilauea south flank (5-13 km)
- 11 SF3 - Kilauea south flank (5-13 km)
- 12 SF4 - Kilauea south flank (5-13 km)
- 13 SF5 - Kilauea south flank (5-13 km) (east end)
- 14 LER - Lower east rift (5-99 km)
- 15 MLO - Mauna Loa (0-13 km)
- 16 LSW - Lower southwest rifts of Kilauea and Mauna Loa (0-13 km)
- 17 GLN - Glenwood (0-13 km)
- 18 SWR - Southwest rift (0-13 km)
- 19 INT - Intermediate caldera (5-13 km)
- 20 KAO - Kaoiki (0-13 km)

Deep:

- 21 DEP - Deep Kilauea (>13 km) (below regions 1-13, 17-19)
- 22 DLS - Deep lower southwest rift (>13 km) (below region 16)
- 23 DML - Deep Mauna Loa (>13 km) (below regions 15, 20)

Outer regions, all depths:

- 24 LOI - Loihi
- 25 KON - South Kona
- 26 HUA - Hualalai
- 27 KOH - Kohala
- 28 KEA - Mauna Kea
- 29 HIL - Hilo
- 30 DIS - Distant, everywhere else

Table 4 (continued). The latitude and longitude limits of the regions are given below. When the coordinates overlap, precedence is given, as in the maps.

No.	Code	N. Lat.	S. Lat.	W. Lon.	E. Lon.
1	SNC	19 28.0	19 24.5	155 19.0	155 14.0
2	SSC	19 24.5	19 22.0	155 19.0	155 16.5
3	SEC	19 24.5	19 22.0	155 16.5	155 14.0
4	SER	19 26.0	19 20.5	155 14.0	155 07.2
5	SME	19 26.0	-----	155 07.2	155 00.0
6	KOA	19 22.0	19 20.5	155 17.0	155 14.0
7	SSF	-----	19 10.0	155 17.0	155 00.0
8	SLE	19 32.0	19 16.0	155 00.0	154 40.0
9	SF1	19 22.0	19 10.0	155 17.0	155 14.5
10	SF2	19 26.0	19 10.0	155 14.5	155 12.3
11	SF3	19 26.0	19 10.0	155 12.3	155 09.1
12	SF4	19 26.0	19 10.0	155 09.1	155 05.3
13	SF5	19 26.0	19 10.0	155 05.3	155 00.0
14	LER	19 32.0	19 16.0	155 00.0	154 40.0
15	MLO	19 35.0	19 19.0	155 35.0	155 19.0
16	LSW	19 19.0	18 40.0	155 43.0	155 25.0
17	GLN	19 35.0	19 26.0	155 19.0	155 00.0
18	SWR	19 22.0	19 10.0	155 25.0	155 17.0
19	INT	19 28.0	19 22.0	155 19.0	155 14.0
20	KAO	19 30.0	19 19.0	155 32.0	155 19.0
21	DEP	19 35.0	19 10.0	155 25.0	155 00.0
22	DLS	19 19.0	18 40.0	155 43.0	155 25.0
23	DML	19 35.0	19 19.0	155 35.0	155 19.0
24	LOI	19 10.0	18 40.0	155 25.0	155 00.0
25	KON	19 39.0	19 00.0	156 20.0	155 43.0
26	HUA	19 55.0	19 39.0	156 20.0	155 43.0
27	KOH	20 25.0	19 55.0	156 20.0	155 34.0
28	KEA	20 25.0	19 35.0	155 34.0	154 40.0
29	HIL	19 47.0	19 32.0	155 09.0	154 40.0

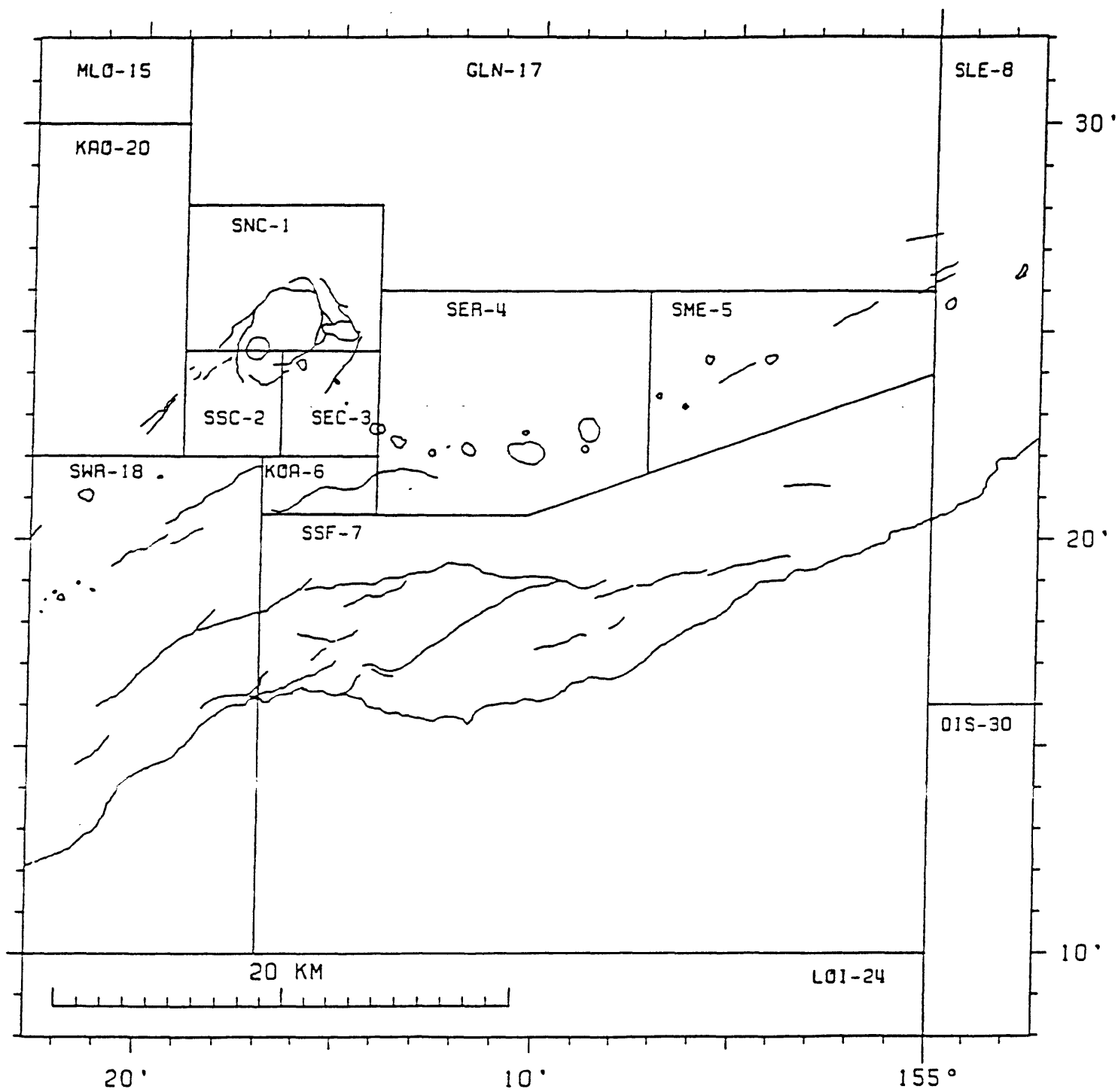


Figure 5. Earthquake classification, shallow (0-5 km deep), for Kilauea and the east flank of Mauna Loa.

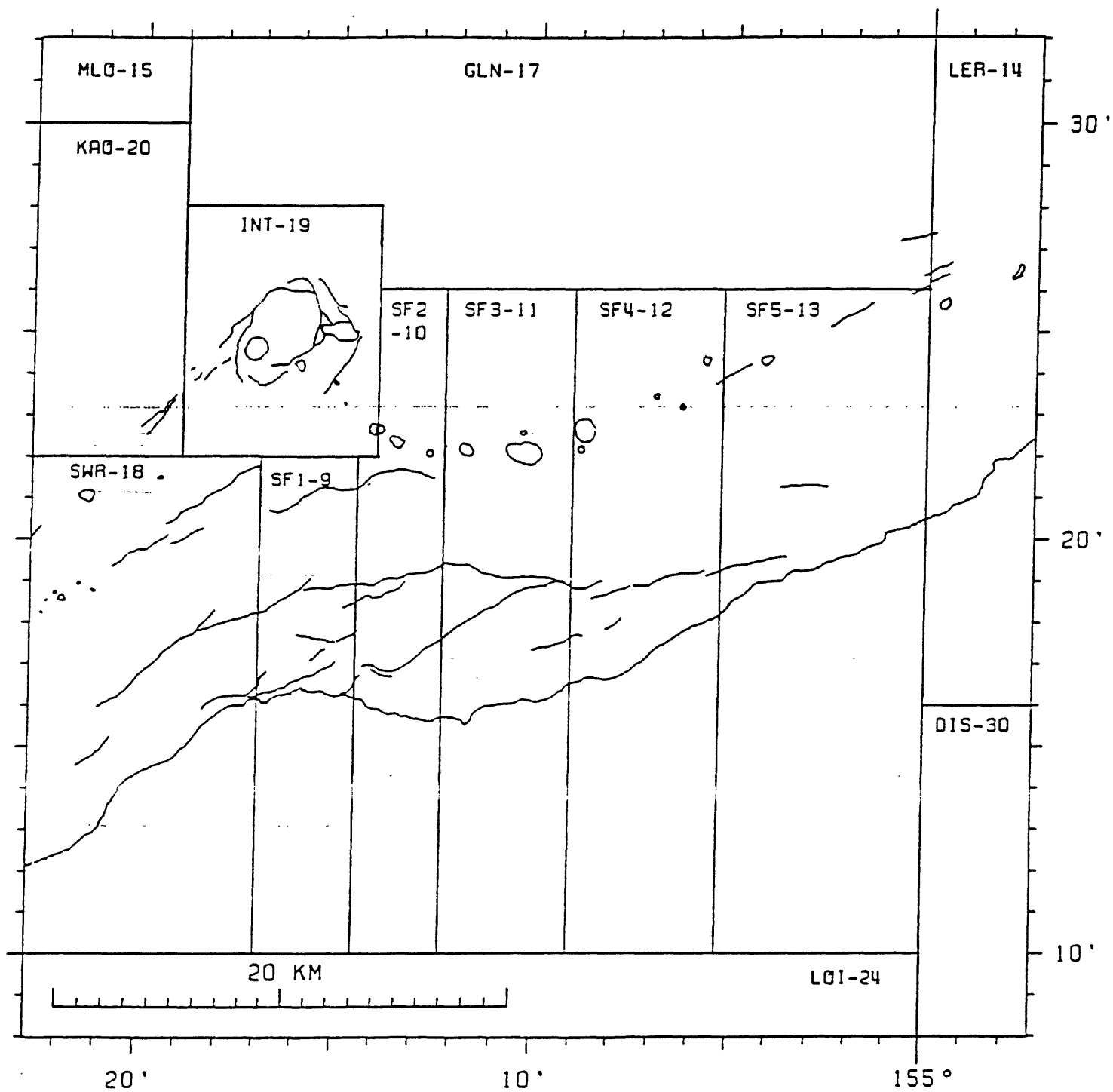


Figure 6. Earthquake classification, intermediate (5.1-13 km deep), for Kilauea and the east flank of Mauna Loa.

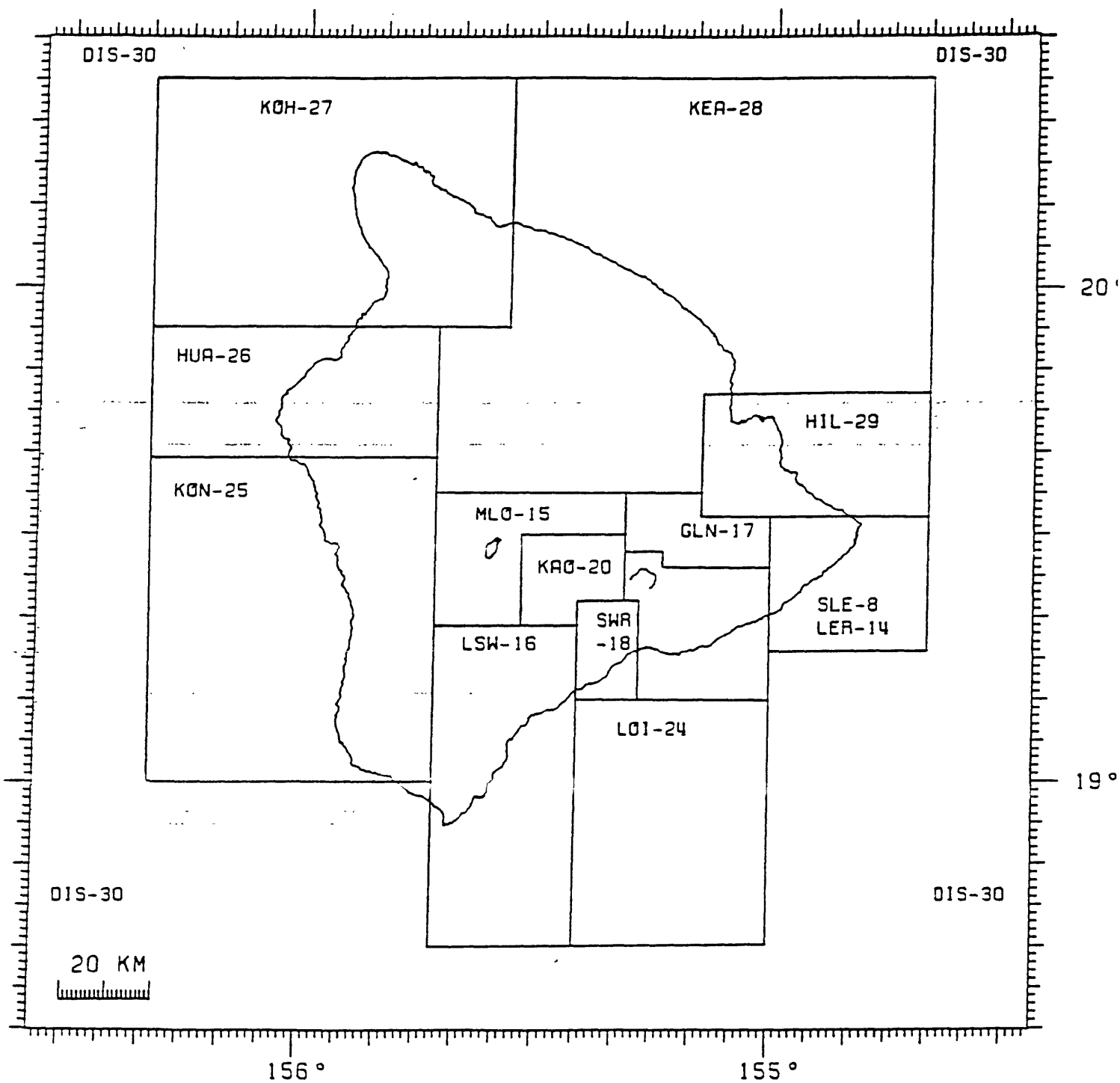


Figure 7. Earthquake classification, crustal (0-13 km deep), for the Island of Hawaii.

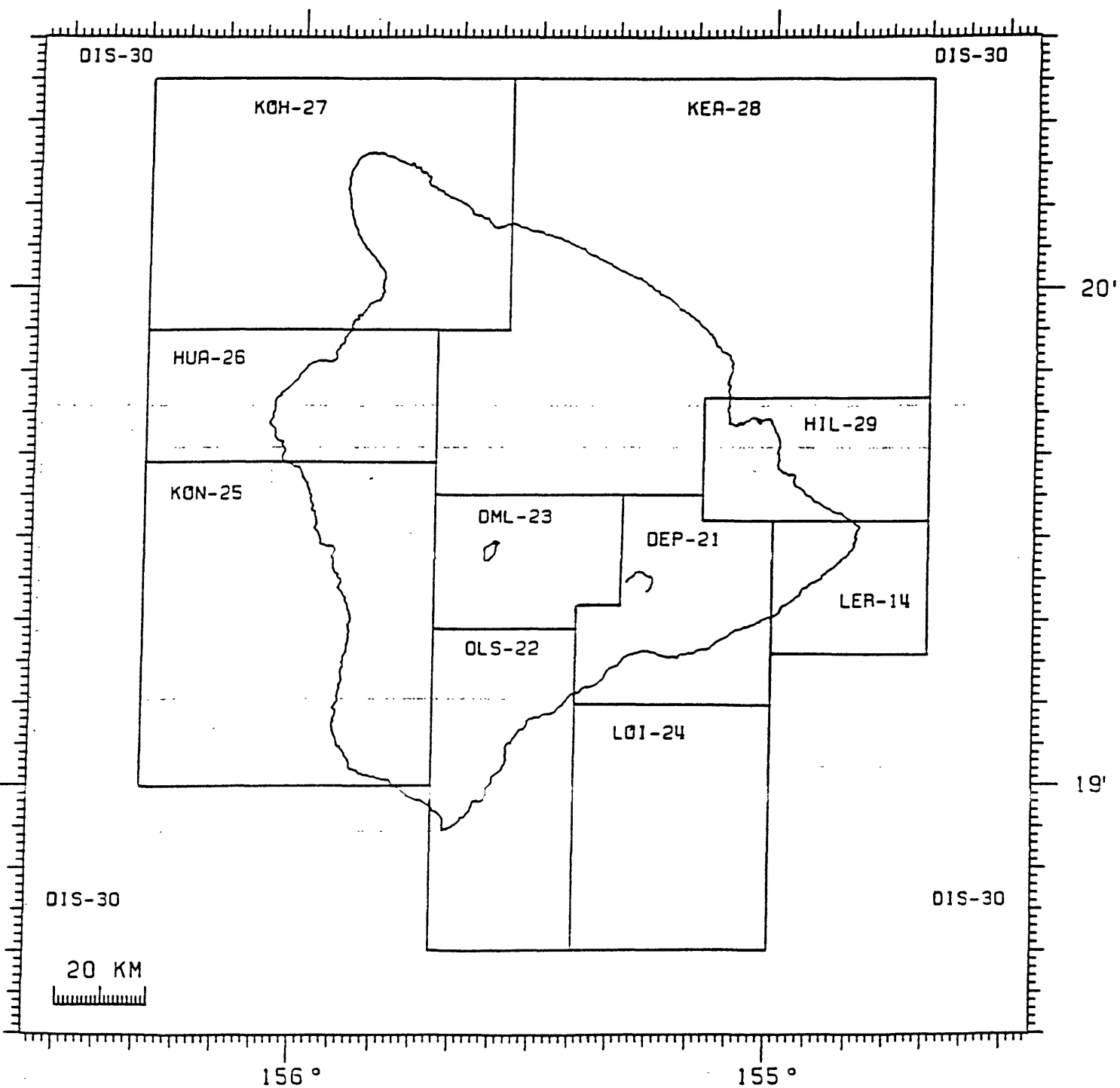


Figure 8. Earthquake classification, deep (greater than 13 km deep), for the Island of Hawaii.

Figure 9. 1988 Earthquake locations, Hawaiian Islands,
0-60 km depth, $M > 3.5$.

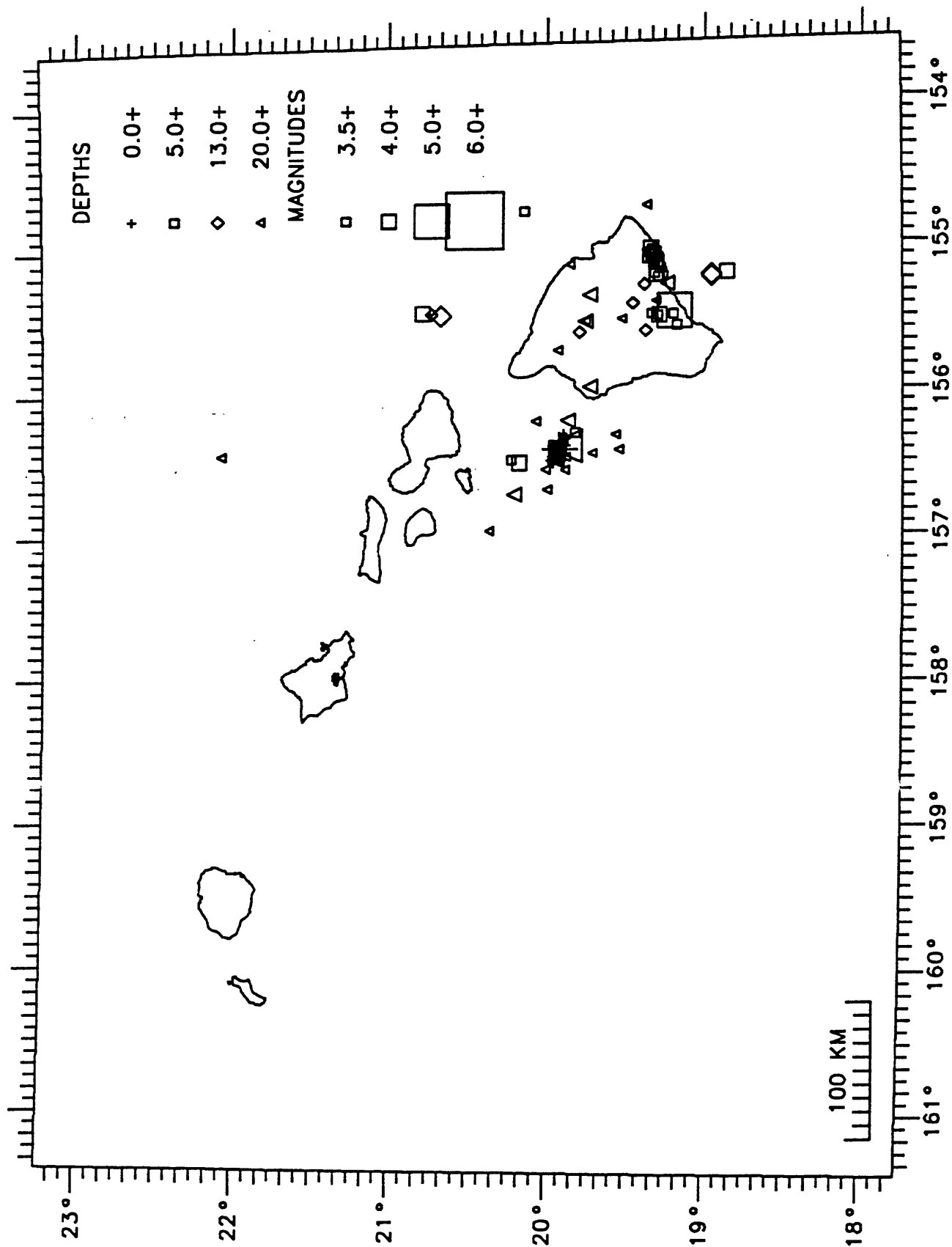


Figure 10. 1988 Earthquake locations, Hawaii Island,
0-60 km depth, $M \geq 3.0$.

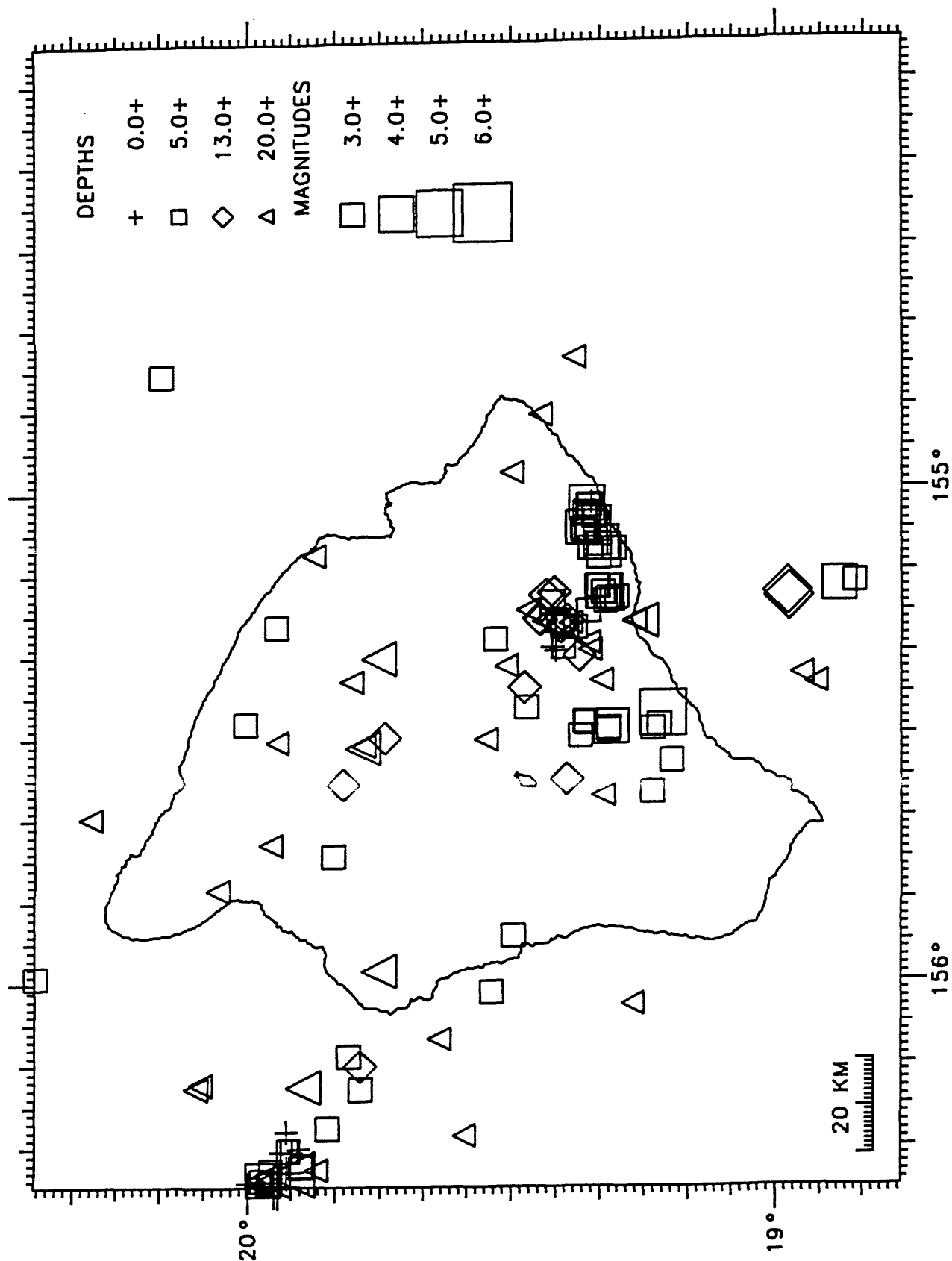


Figure 11. 1988 Earthquake locations, Hawaii Island, shallow ($0-5.0$ km depth), $M \geq 2.0$.

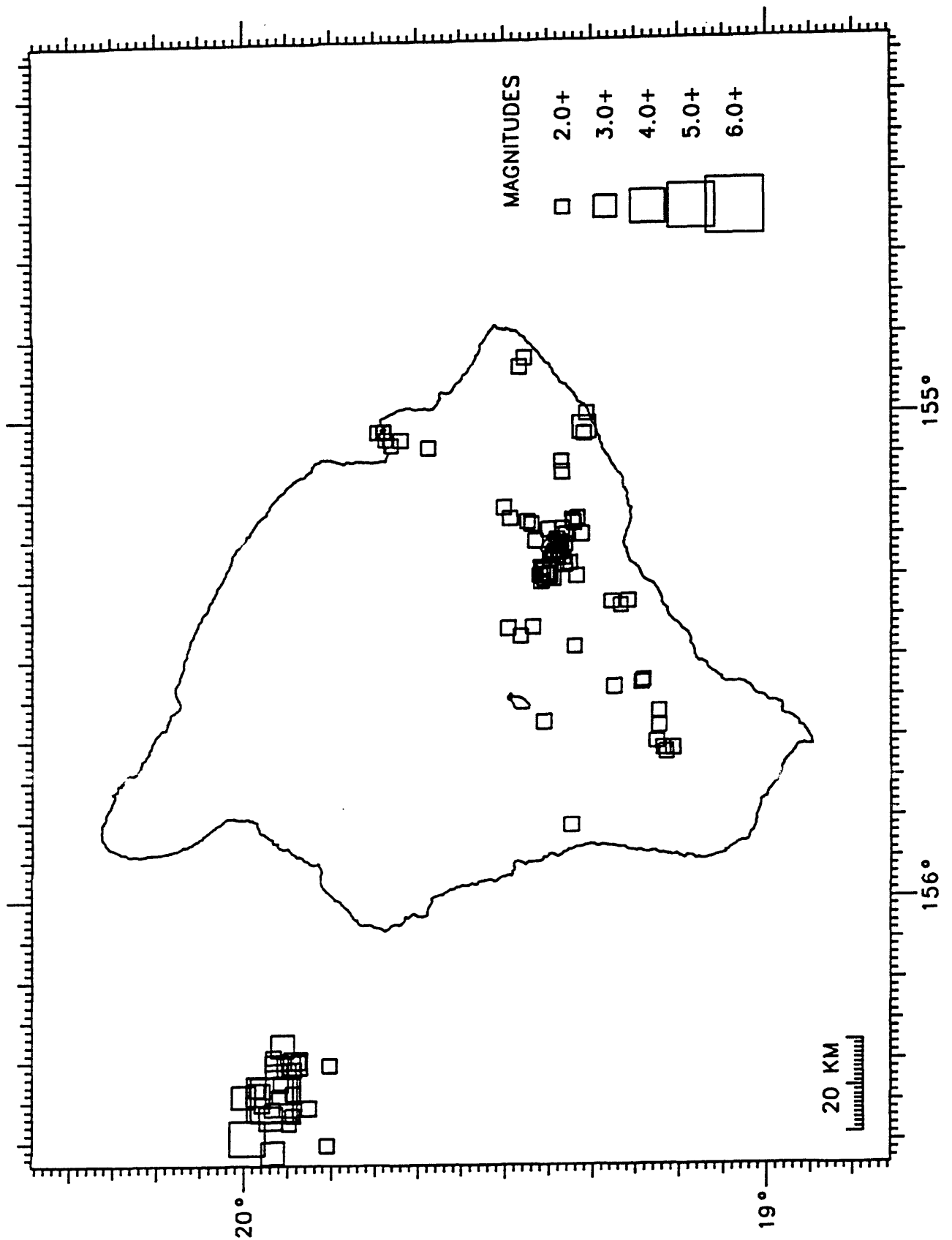


Figure 12. 1988 Earthquake locations, Hawaii Island, intermediate (5.1–13.0 km depth), $M \geq 2.0$.

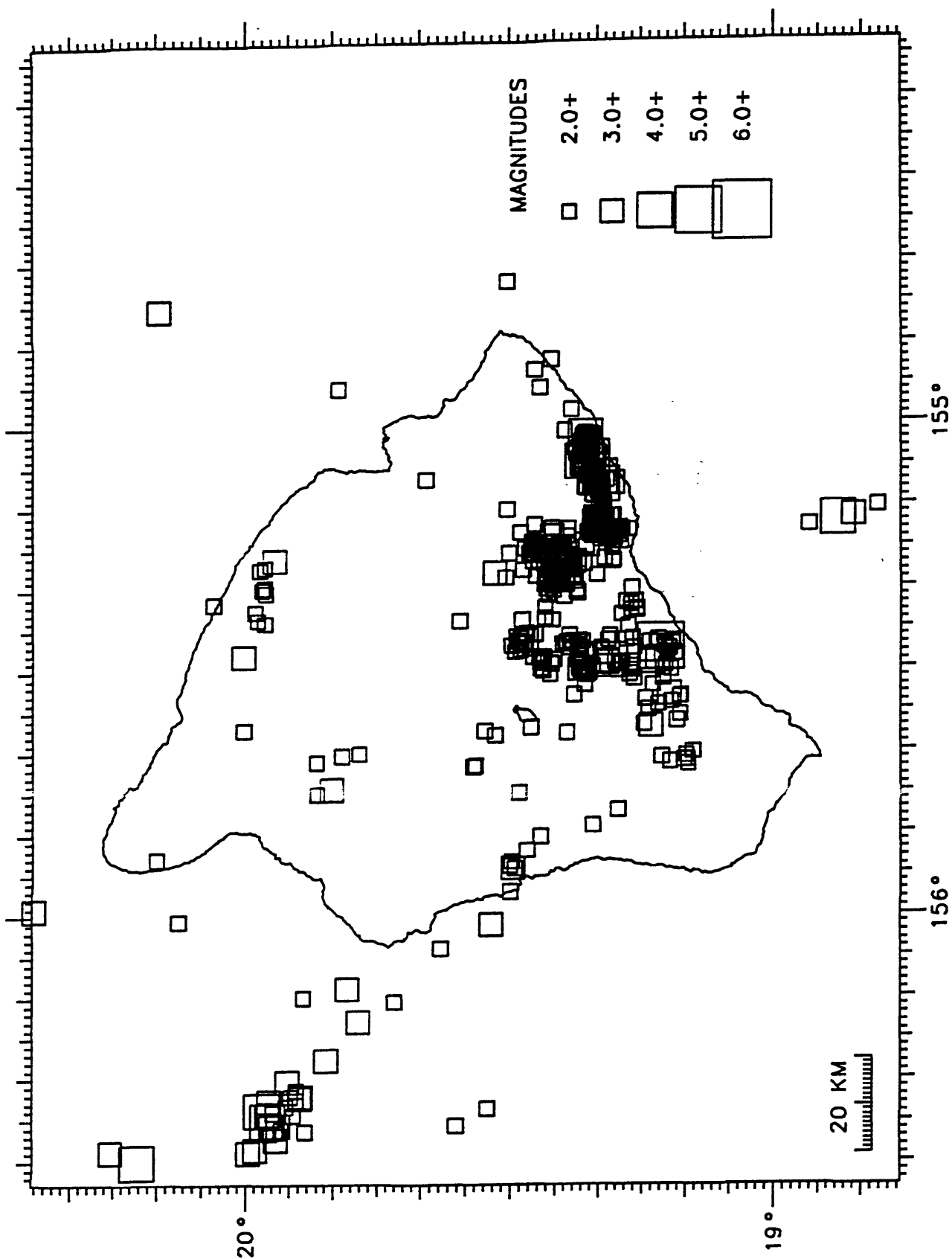


Figure 13. 1988 Earthquake locations, Hawaii Island, deep (13.1–60.0 km depth), $M \geq 2.0$.

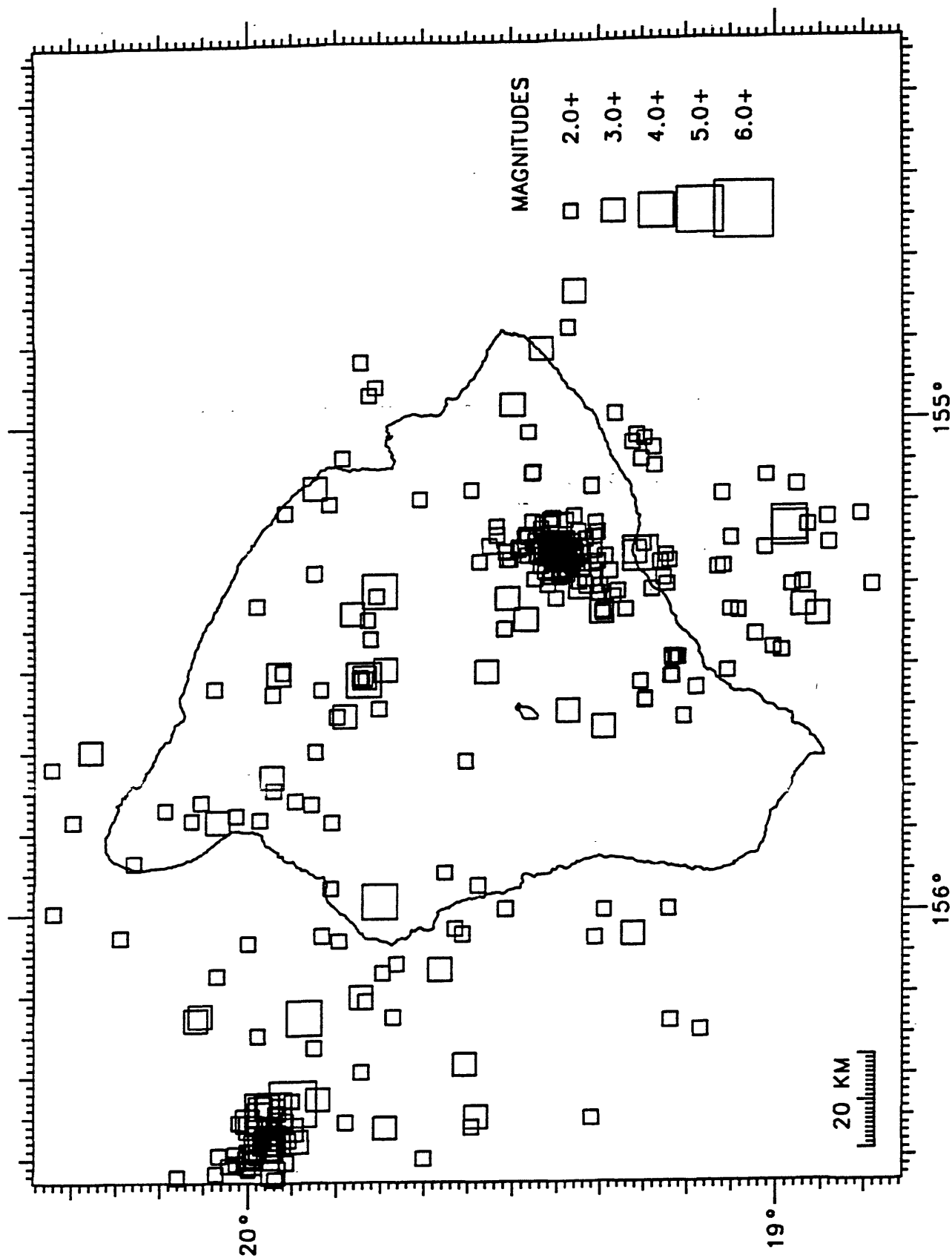


Figure 14. 1988 Earthquake locations, Kilauea summit, shallow (0–5.0 km depth), $M \geq 1.0$.

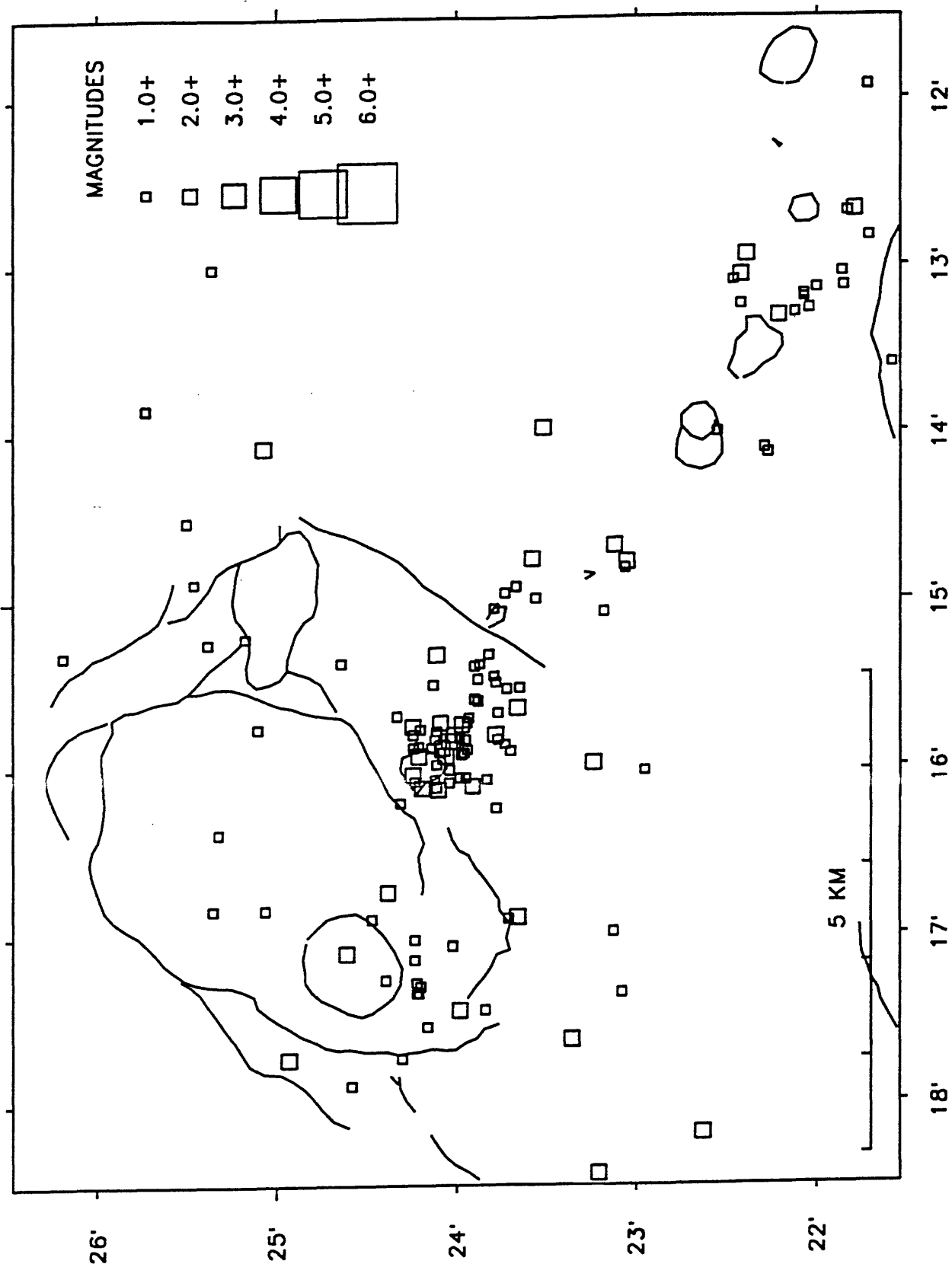


Figure 15. 1988 Earthquake locations, Kilauea summit, intermediate (5.1–13.0 km depth), $M \geq 1.0$.

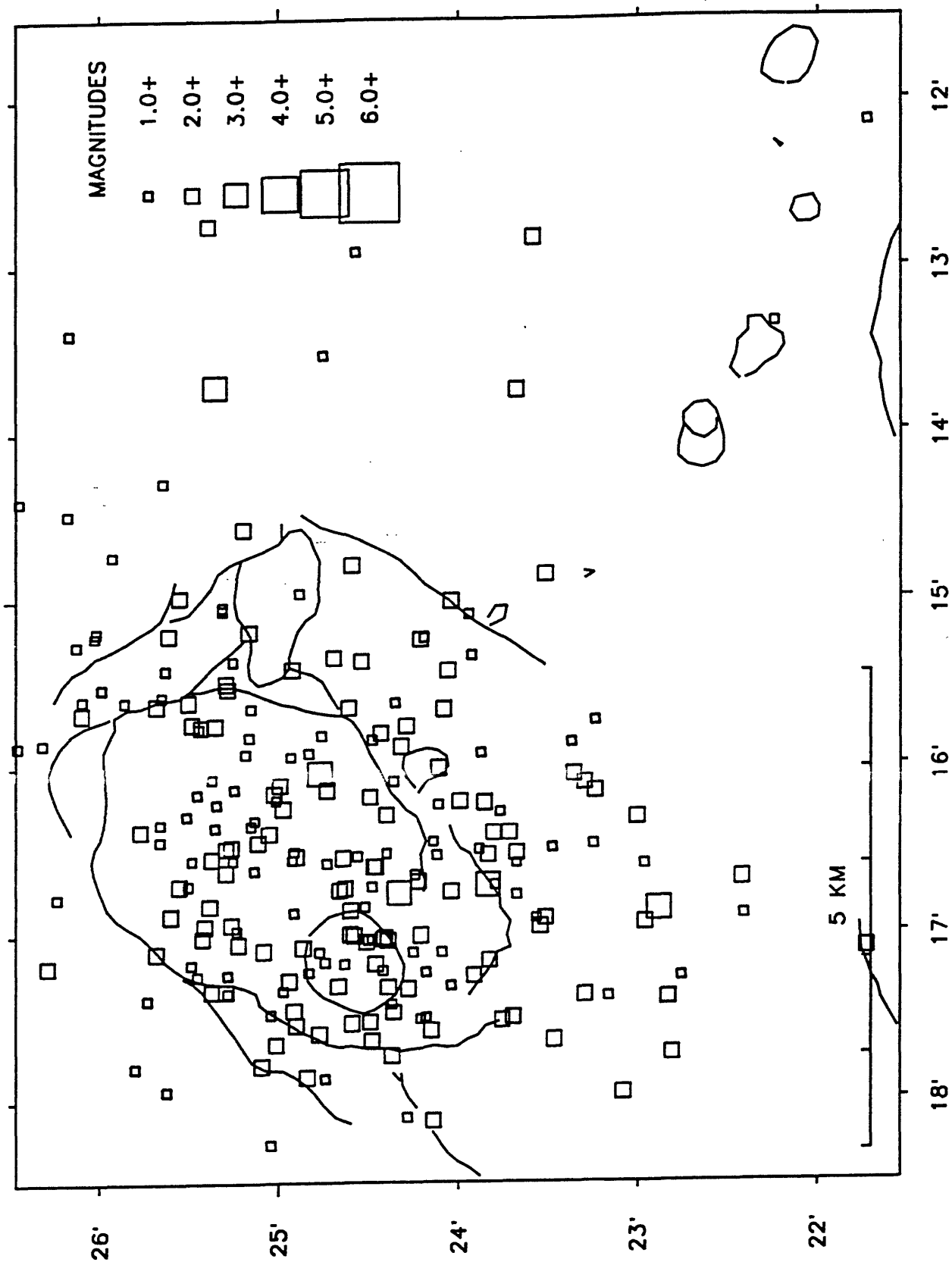


Figure 16. 1988 Earthquake locations, Kilauea summit,
deep (13.1–60.0 km depth), $M \geq 1.0$.

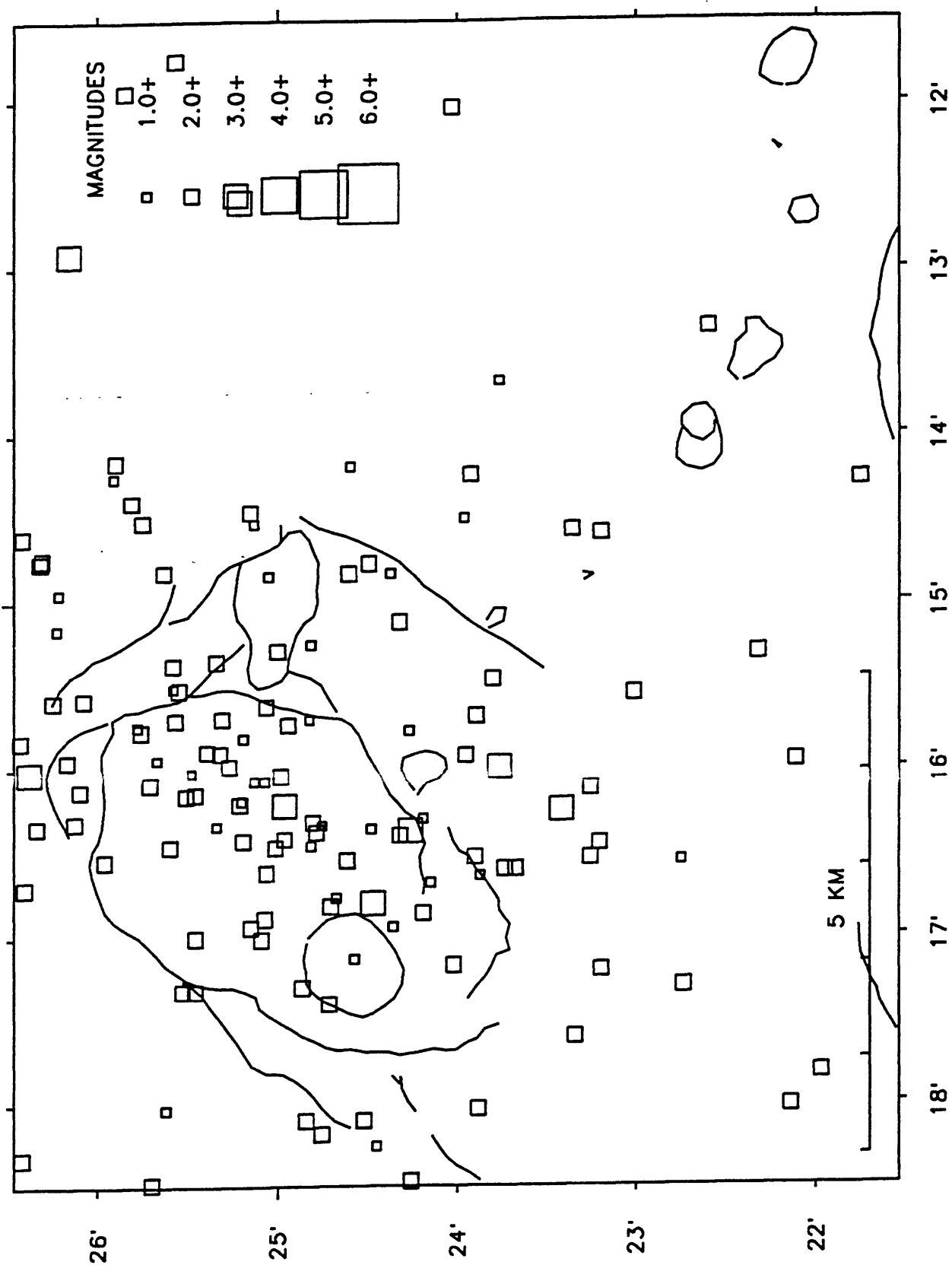


Figure 17. 1988 Earthquake locations, Kilauea south flank, shallow (0–5.0 km depth), $M \geq 2.0$.

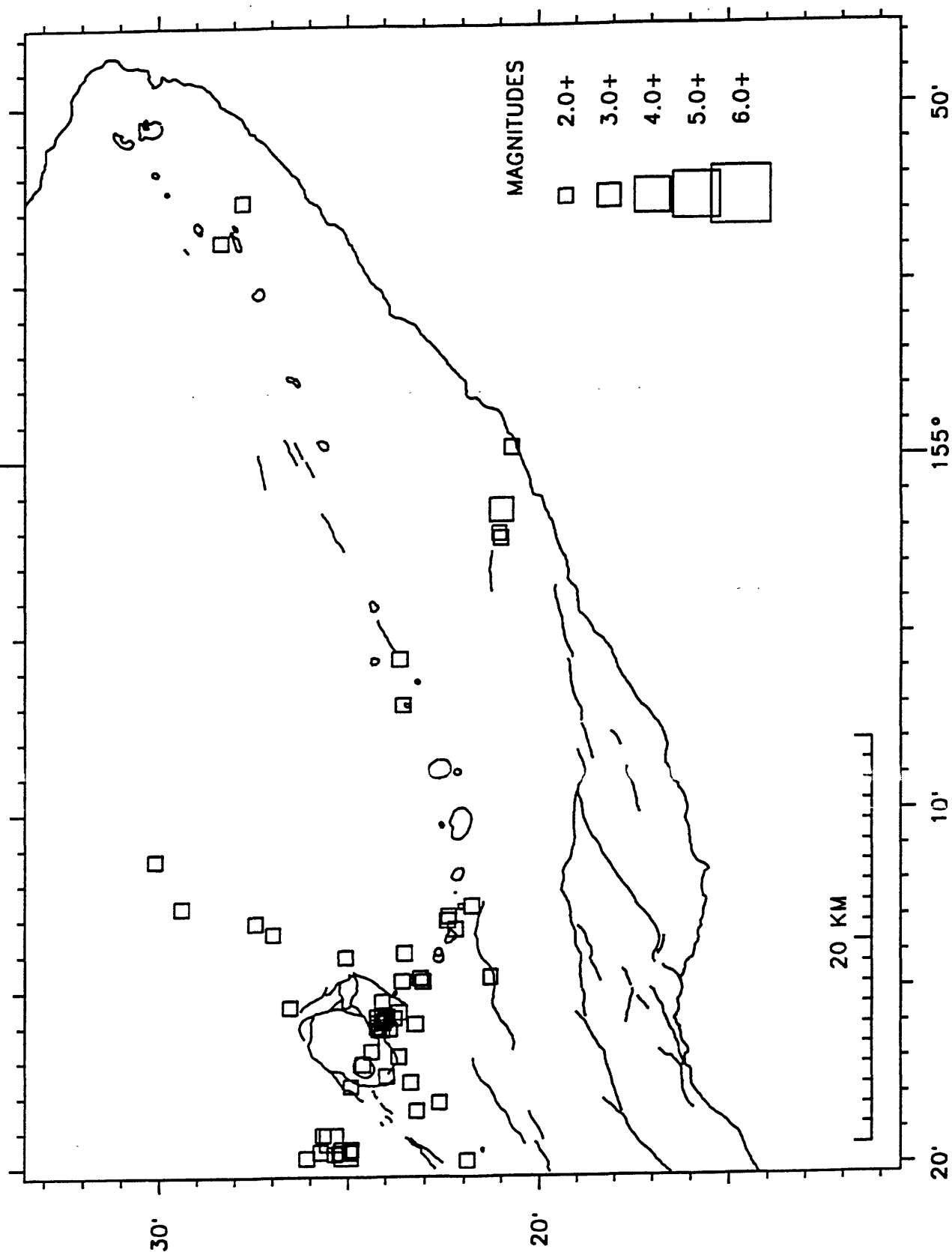


Figure 18. 1988 Earthquake locations, Kilauea south flank, intermediate (5.1–13.0 km depth), $M \geq 2.0$.

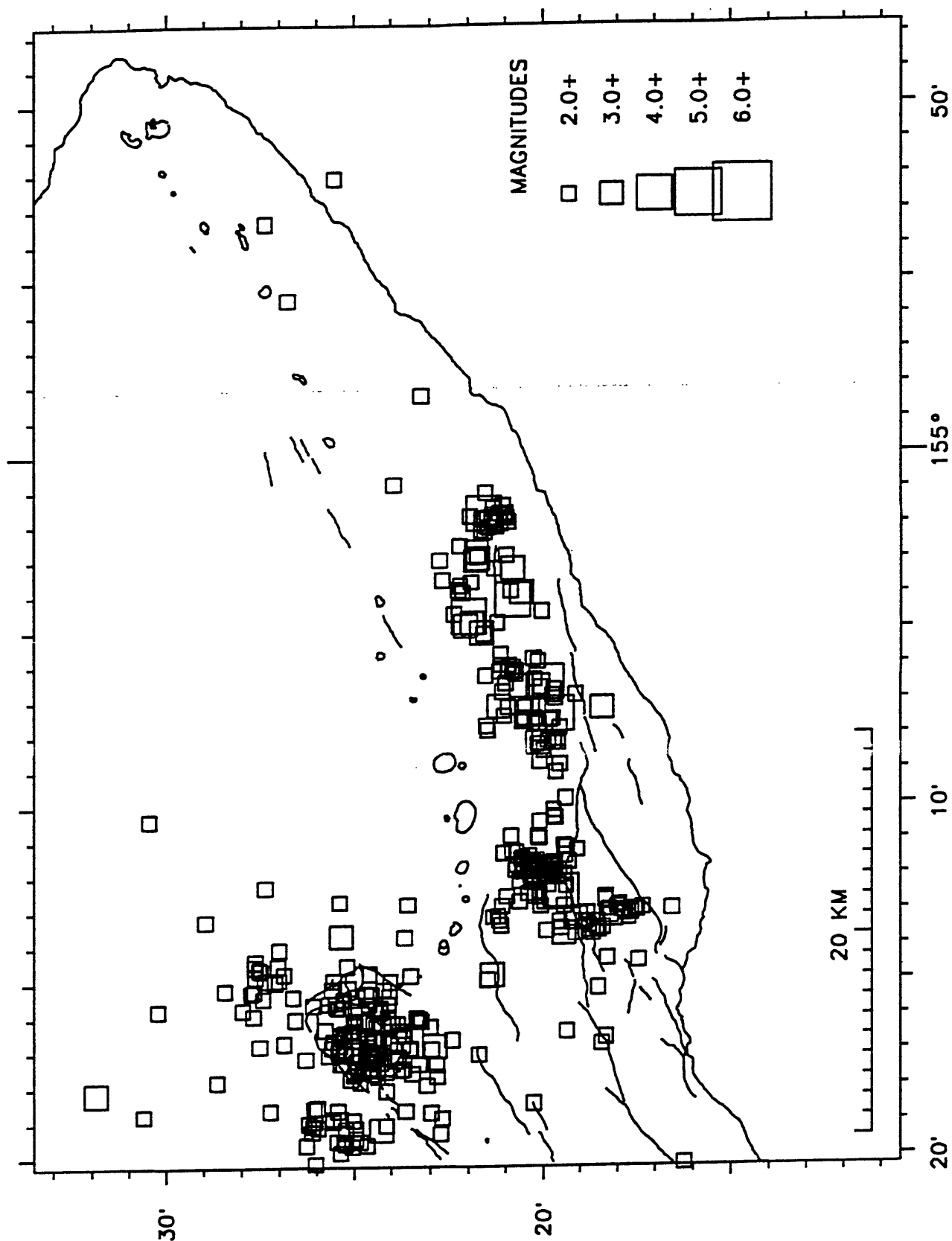


Figure 19. 1988 Earthquake locations, Kilauea south flank, deep (13.1–60.0 km depth), $M \geq 2.0$.

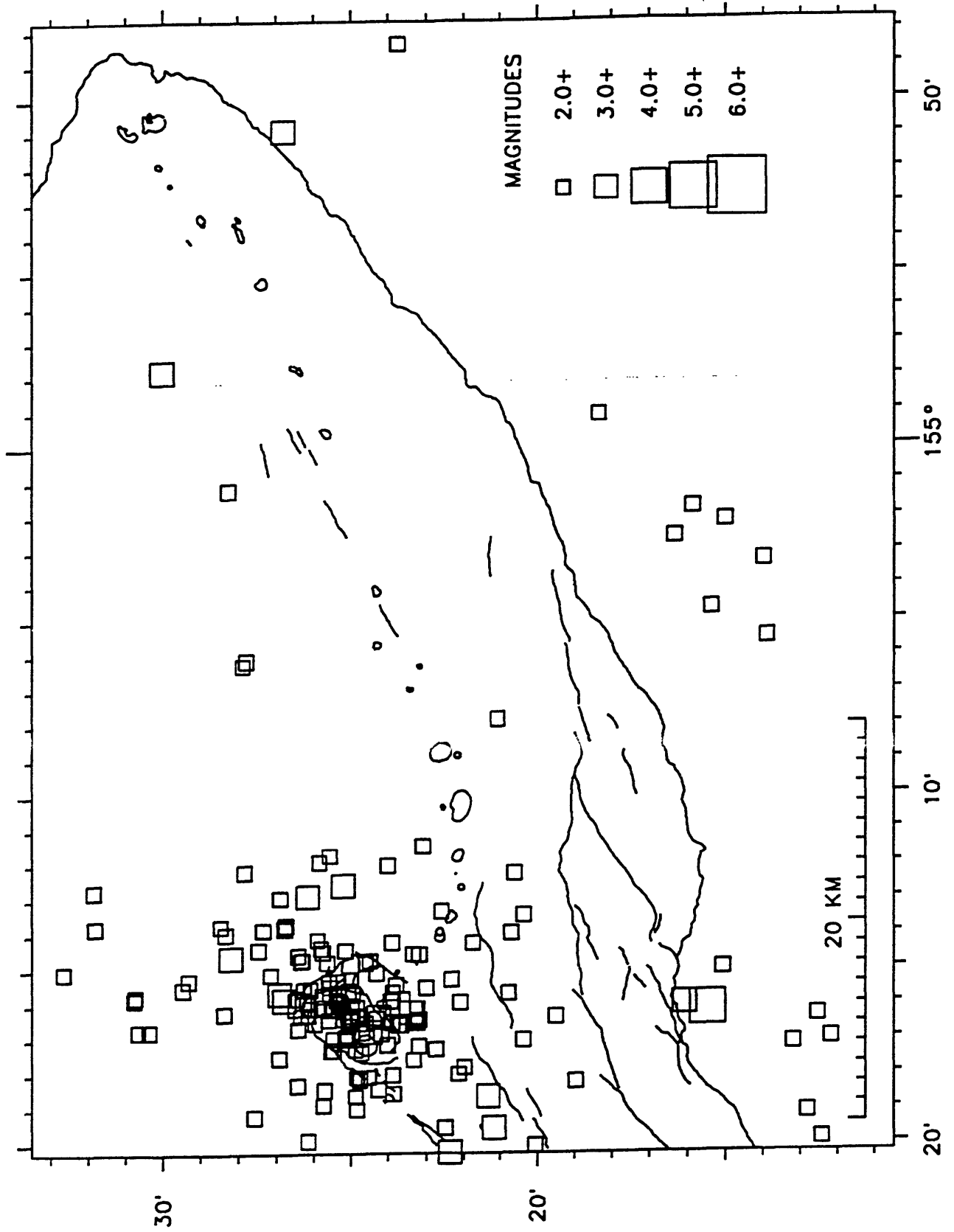


Figure 20. 1988 Earthquake locations, Mauna Loa summit, shallow (0-5.0 km depth), $M \geq 2.0$.

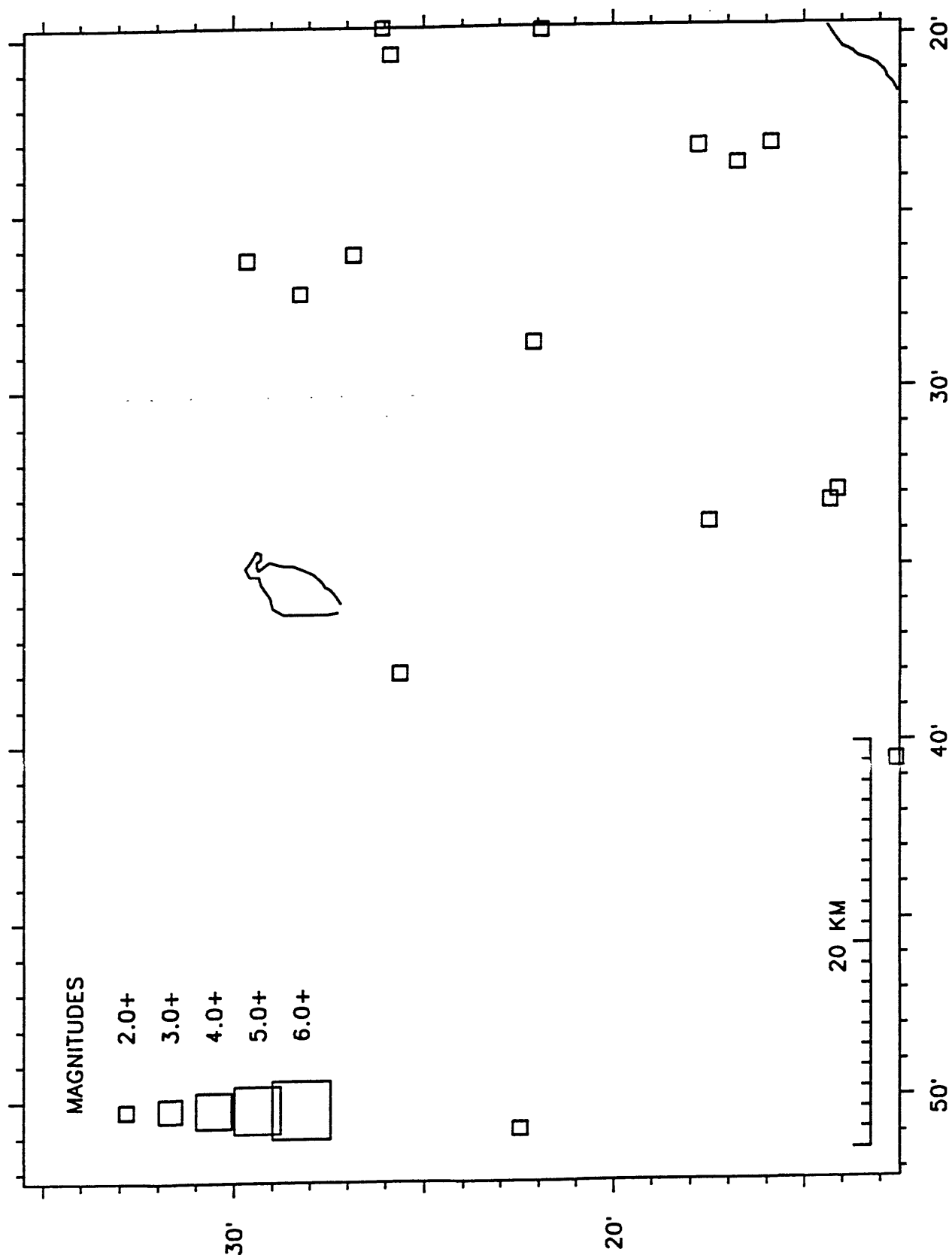


Figure 21. 1988 Earthquake locations, Mauna Loa summit, intermediate (5.1–13.0 km depth), $M \geq 2.0$.

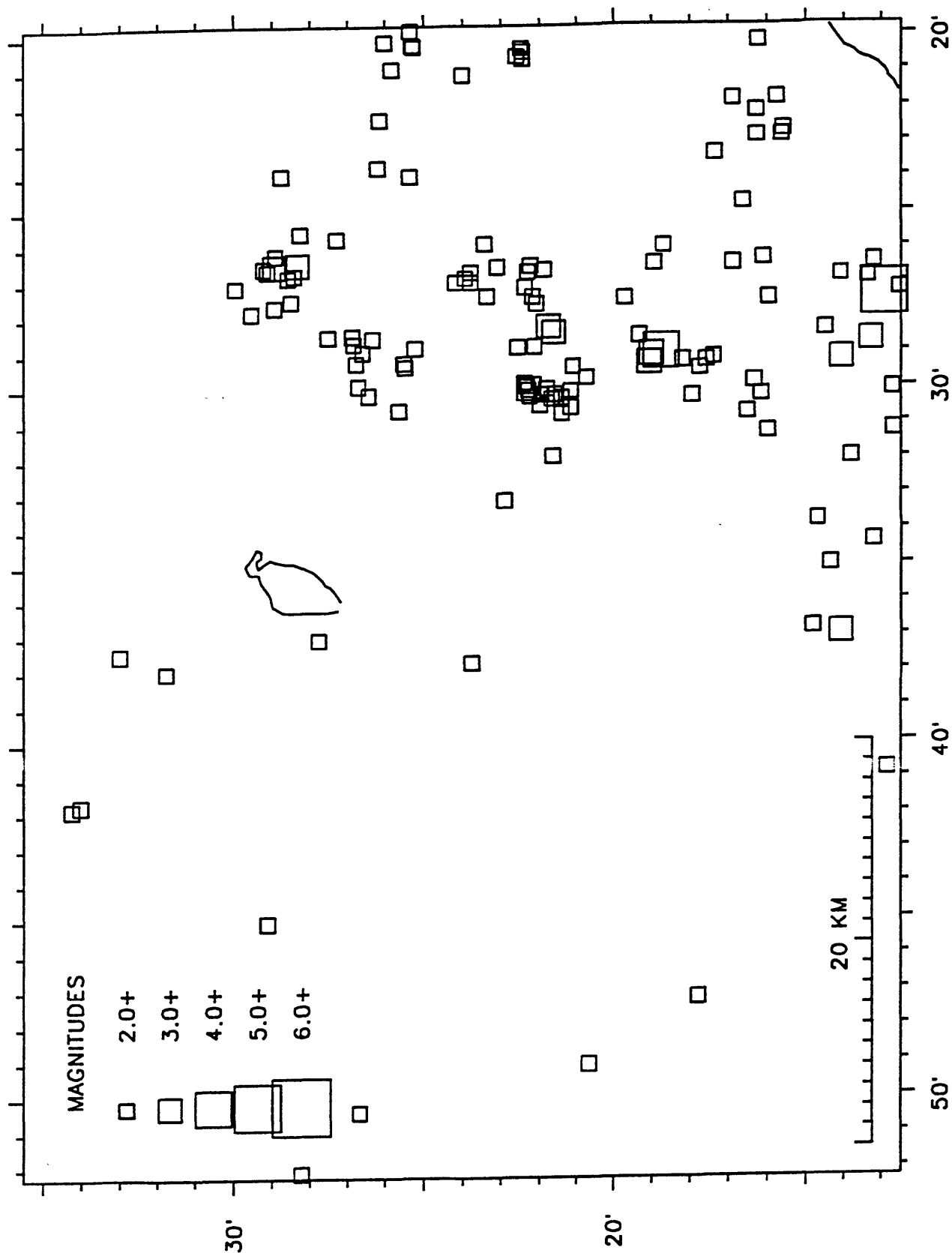


Figure 22. 1988 Earthquake locations, Mauna Loa summit, deep (13.1–60.0 km depth), $M \geq 2.0$.

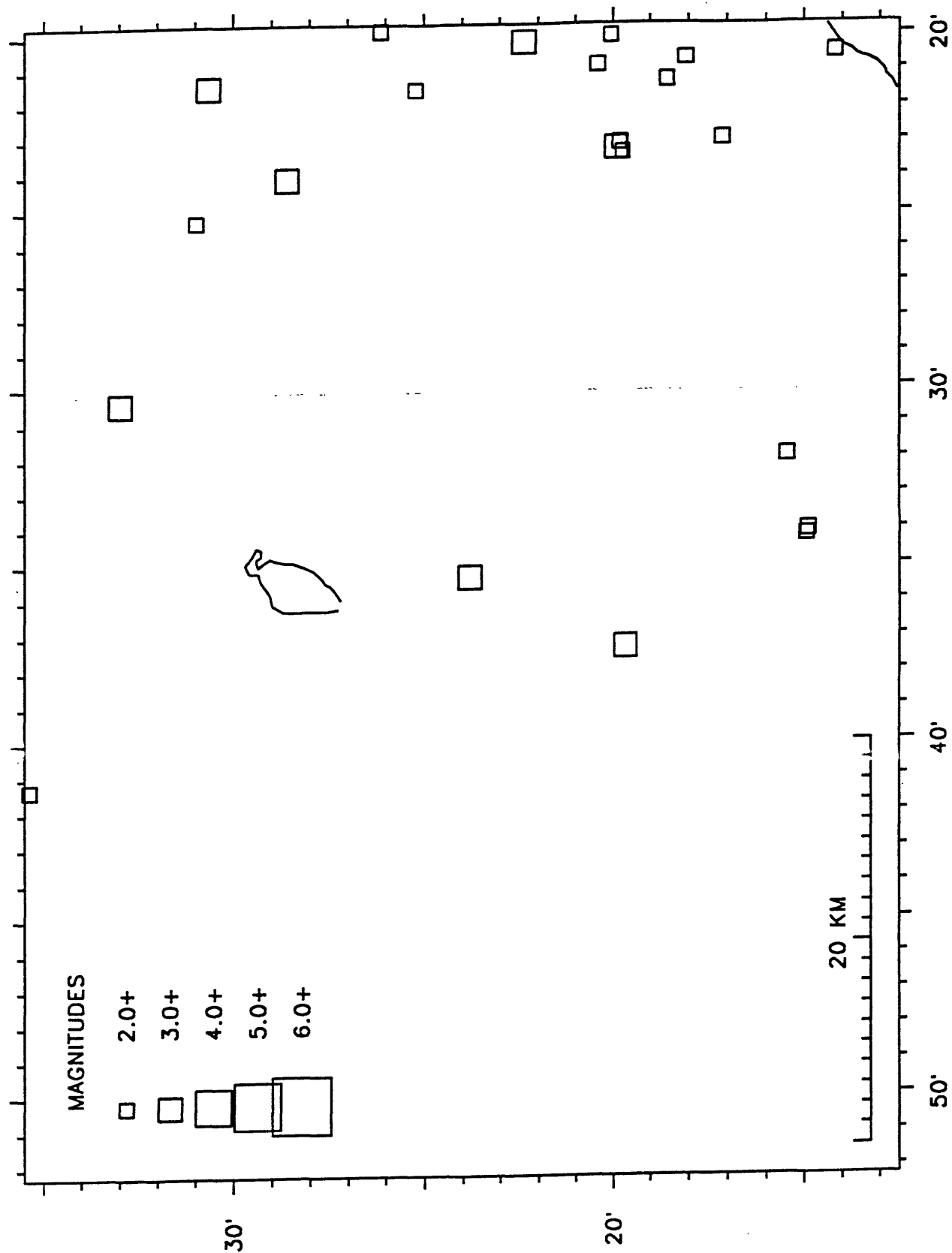


Table 5 is a chronological list of selected events $M \geq 1.4$, successfully located during 1988. For each event, the following data are presented:

ORIGIN TIME - in Hawaiian Standard Time: date, hour (HR), minute (MN), and second (SEC).

EPICENTER - in degrees and minutes of north latitude (LAT N) and west longitude (LON W).

DEPTH - Depth of focus in kilometers.

AMP MAG - Amplitude magnitude, if determined.

DUR MAG - Duration magnitude, if determined.

NR - Number of arrivals (P and S) used in the solution.

NS - Number of S arrivals used in the solution.

GAP DEG - Largest azimuthal separation in degrees between stations.

RMS SEC - Root mean square error of time residuals, in seconds.

$$\text{RMS} = (\sum R_i^2 / \text{NR})^{1/2}$$

MIN DIS - Epicentral distance, in kilometers, to the third nearest station.

ERH km - Standard error of the epicenter, in kilometers.

ERZ km - Standard error of depth of focus, in kilometers.

REMK - Remarks, three-letter code for geographic location of events. See Figures 5-8 for location of mnemonic code. Additional one-letter codes have the following meanings:

F felt

L long-period character

T associated with harmonic tremor

B quarry or other blast

* the location program had a convergence problem, which usually means that the depth may be unreliable

- the depth was held fixed

Table 6 is a list of events of magnitude 3.0 or greater, selected from Table 5.

Table 5.

1988 HVO EARTHQUAKE SUMMARY LIST

1

1988 HVO EARTHQUAKE SUMMARY LIST

2

YEAR	MON	DA	HR	MIN	SEC	LAT	N	DEG	MIN	DEG	MIN	W	DEPTH	AMP	DUR	KM	MAG	NR	NS	DEG	SEC	DIS	KM	RM	FM	REMARK
ORIGIN	TIME																									
1988	JAN	1	635	35.55	19	38.93		156	28.09		6.96		1.6	35	8	282	.18	60	1.9	2.5	28	DIS				
		1	649	49.21	19	22.03		155	0.70		8.11	1.8	1.2	36	5	175	.13	6	0.6	0.5	32	SP5				
		1	1517	8.85	19	19.93		155	12.60		7.84	1.9	1.4	38	7	76	.14	5	0.4	0.5	33	SP2				
		1	22	0	17.39	19	44.81	156	7.24		14.10	2.5	1.7	32	10	282	.12	30	0.7	0.6	23	HUA				
		2	056	53.85	19	19.51		155	13.51		9.89	2.6	2.6	54	11	119	.14	6	0.4	0.4	0.3	43	SP2			
		2	355	55.21	19	18.94		155	14.91		7.51	0.9	1.1	23	0	139	.09	7	0.6	1.1	16	SP1				
		2	18	1	15.36	19	19.80	155	11.67		7.42	2.1	1.7	42	4	88	.11	5	0.4	0.6	22	SP3				
		2	1854	33.24	19	24.09		155	15.73		3.13	2.5	2.1	31	5	74	.08	2	0.3	0.3	23	SEC				
		2	2144	43.82	19	21.02		155	30.17		9.85	2.0	1.5	37	3	34	.10	5	0.3	0.7	19	KAO				
		3	942	42.71	19	17.95		155	30.24		9.54	2.3	1.9	34	4	68	.11	5	0.3	0.7	27	LSW				
		3	2012	56.85	19	20.39		155	11.85		8.01	2.7	2.4	50	8	76	.13	5	0.4	0.4	45	SP3				
		3	2349	4.71	19	22.06		155	26.29		9.99	2.1	1.6	33	5	41	.11	2	0.3	0.4	28	KAO				
		4	2233	13.46	19	32.83		155	43.75		11.16	2.2	1.5	35	5	72	.15	6	0.4	0.4	31	KAN				
		5	618	44.04	19	43.03		156	10.51		12.90	2.5	2.1	49	9	255	.13	35	0.6	0.5	42	HUA				
		5	1011	23.63	19	22.11		155	4.87		7.74	1.7	1.6	31	1	78	.11	4	0.4	0.8	27	SP5				
		5	20	2	49.13	19	52.00	155	45.13		12.74	2.5	2.5	32	1	150	.09	10	1.1	0.4	17	HUA				
		6	148	27.71	19	17.79		155	23.13		2.85	2.1	2.1	33	5	100	.11	4	0.3	0.7	27	SMR				
		6	227	57.91	19	48.59		156	9.24		16.81		1.8	25	4	290	.16	36	1.5	17.1	21	HUA				
		6	1252	46.03	19	13.21		155	26.89		7.64	1.7	1.2	16	3	128	.10	5	0.7	1.3	11	LSW				
		6	13	8	27.67	19	29.65	155	26.30		4.77	2.4	1.9	33	9	89	.10	5	0.3	1.2	20	KAO				
		6	2145	55.08	19	18.59		155	16.34		6.66	1.9	1.5	37	10	111	.12	3	0.3	0.6	26	SP1				
		8	426	33.31	19	16.17		155	30.22		9.07	2.4	2.5	46	3	54	.16	2	0.4	0.6	27	LSW				
		9	024	16.29	19	17.49		155	13.20		9.41	2.1	1.2	34	6	150	.09	9	0.5	0.6	21	SP2				
		9	622	4.70	19	26.23		155	29.82		10.96	1.7	1.2	30	5	40	.08	6	0.4	0.7	24	KAO				
		9	1013	19.39	19	19.78		155	11.04		8.09	2.0	1.4	35	2	91	.11	5	0.5	0.8	29	SP3				
		9	1834	16.43	19	19.32		155	13.49		7.97	1.9	1.4	38	3	69	.12	4	0.4	0.8	24	SP2				
		9	1937	48.60	19	24.19		155	16.12		2.99	2.3	1.8	29	5	70	.09	1	0.3	0.3	17	SEC				
		9	23	3	29.79	19	17.96	155	12.86		9.78	2.2	1.9	46	5	143	.13	9	0.4	0.5	24	SP2				
		10	8	4	26.72	19	21.07	155	11.54		8.43	1.9	1.2	34	6	68	.11	3	0.4	0.6	24	SP3				
		10	1452	7.69	19	23.11		155	26.59		9.87	2.5	2.8	48	7	31	.14	2	0.3	0.4	42	KAO				
		10	1813	31.20	19	23.76		155	37.77		10.52		2.4	40	8	48	.14	6	0.3	0.5	32	MLO				
		10	1815	49.23	19	20.07		155	12.88		7.09		2.2	41	6	71	.15	5	0.4	0.5	35	SP2				
		11	326	21.62	19	54.08		155	43.47		13.53		1.5	14	2	268	.09	8	1.9	0.5	12	HUA				
		11	1017	57.90	19	52.93		155	46.51		20.04	2.3	2.3	28	4	162	.10	12	0.7	1.0	24	HUA				
		11	1047	15.52	19	23.67		155	14.92		3.91	2.0	1.1	19	6	91	.10	2	0.5	0.5	13	SEC				
		11	1739	52.81	19	20.24		155	6.42		7.35	2.9		46	5	112	.13	6	0.4	0.6	35	SP4				
		11	1950	39.80	19	51.53		155	44.89		12.45	2.2	1.6	23	4	238	.09	9	1.3	0.4	11	HUA				
		11	2218	33.15	19	47.12		155	40.18		12.65	2.4	2.1	43	7	128	.11	8	0.5	0.3	38	KEA				
		11	2354	15.93	19	22.47		155	29.90		9.29	2.0	1.5	41	4	32	.11	4	0.3	0.5	37	KAO				
		12	1046	32.34	19	58.76		155	48.35		13.86		2.0	18	3	304	.09	20	1.8	0.6	12	KOH				
		12	2056	53.09	19	23.88		155	15.60		2.93	1.7	1.0	24	9	73	.09	2	0.2	0.3	15	SEC				
		13	159	17.84	19	24.11		155	15.98		2.52	1.6	1.9	28	8	71	.10	1	0.2	0.2	22	SEC				
		13	620	41.75	19	29.40		155	27.26		5.00	2.4	1.5	46	8	83	.12	5	0.3	1.3	27	KAO				
		13	1228	3.04	20	2.45		155	24.03		11.86		1.5	10	2	236	.07	18	2.2	0.7	2	KEA				
		13	1732	2.78	19	25.52		155	29.29		9.31	2.4	2.4	45	7	36	.12	6	0.3	0.6	40	KAO				

1988 HVO EARTHQUAKE SUMMARY LIST

YEAR	MON	DA	HHRN	SEC	ORIGIN TIME	LAT N	DEG MIN	LONG W	DEPTH AMP DUR	KM	MAG	MAG NR	NS	DEG SEC	DIS KM	GAP RMS	MIN ESH	EZ2 NO			
1988	JUN	22	2134	49.22	19	53.76	155	19.61	9.71	2.0	1.8	14	0	240	.07	2	1.2	0.5	3	KEA	
		22	2248	34.78	19	57.97	155	19.82	10.23	2.3	2.3	26	6	200	.10	9	0.7	0.4	12	KEA	
		22	2336	37.25	19	20.01	155	7.27	7.46	1.8	1.4	19	1	103	.07	5	0.4	0.7	14	SF4	
		23	256	55.83	19	19.40	155	11.95	6.47	1.9	1.3	30	3	94	.10	5	0.4	1.0	18	SF3	
		23	3	59.35	19	57.13	155	20.45	12.15	2.1	1.5	19	3	240	.06	7	1.3	0.4	8	KEA	
		23	945	43.17	19	15.87	155	1.76	46.33	2.4	1.7	41	2	209	.11	8	1.1	1.2	34	DEP	
		23	1331	38.36	19	57.13	155	20.44	12.42	2.2	1.6	30	4	196	.13	7	0.8	0.3	27	KEA	
		24	721	5.88	19	20.04	155	12.14	9.40	2.1	1.6	14	0	200	.11	5	1.2	1.1	14	SF3	
		24	1726	31.67	19	17.15	155	6.01	2.96	1.7	1.1	23	0	221	.12	3	1.1	0.8	16	SSF	
		24	1730	28.24	19	20.39	155	12.21	7.12	2.0	1.9	31	0	73	.13	4	0.5	0.8	26	SF3	
		25	1518	29.68	19	14.12	155	32.91	0.34	2.7	2.7	50	9	72	.18	12	0.3	0.2	30	LSW	
		25	1525	53.69	19	19.61	155	11.73	5.86	1.7	1.3	34	3	91	.11	6	0.4	1.0	21	SF3	
		25	20	3	5.57	19	19.93	155	12.17	8.00	1.9	1.2	27	3	81	.10	5	0.5	0.7	15	SF3
		25	2128	56.07	19	20.57	155	7.64	7.44	2.2	2.0	54	11	88	.16	5	0.4	0.4	44	SF4	
		25	2314	31.62	19	43.51	156	4.15	8.66	1.4	25	2	281	.12	24	1.4	1.0	23	HUA		
		26	319	11.24	19	29.22	155	26.59	5.30	2.5	1.7	57	16	57	.13	5	0.2	0.9	42	KAO	
		26	1142	45.06	19	30.14	155	54.02	9.65	2.6	1.7	31	5	147	.21	2	0.7	0.6	22	KCN	
		26	1224	27.51	19	21.11	155	11.29	8.60	2.2	1.7	36	5	69	.13	3	0.5	0.6	29	SF3	
		26	1371	15.11	19	24.14	155	15.88	3.26	1.9	1.0	27	12	121	.08	1	0.3	0.3	9	SEC	
		26	1524	36.00	19	20.58	155	3.94	8.61	3.9	4.0	49	5	105	.11	2	0.5	0.4	43	SF5 F	
		26	1649	4.39	19	20.65	155	3.88	5.83	1.7	1.7	34	1	101	.13	2	0.5	0.9	14	SF5	
		26	1917	14.90	19	21.06	155	11.39	9.03	2.3	1.9	41	6	68	.12	3	0.4	0.3	22	SF3	
		26	1922	46.56	19	21.02	155	11.35	8.52	2.1	1.7	43	6	69	.11	3	0.3	0.3	20	SF3	
		27	1537	16.76	19	20.83	155	3.76	7.02	1.7	1.3	28	0	92	.10	2	0.5	0.9	16	SF5	
		27	1558	49.04	19	24.27	155	15.77	33.45	1.9	1.5	20	0	119	.08	2	1.7	4.8	7	DEP L	
		27	1935	28.94	19	16.84	155	23.05	7.87	1.1	1.9	2	113	.12	5	0.6	1.4	11	SWR		
		28	437	27.82	19	18.04	155	13.33	7.97	1.6	1.2	47	8	91	.12	2	0.4	0.4	40	SF2	
		28	1219	46.04	19	31.98	155	56.63	17.69	2.3	2.1	23	3	232	.11	9	1.2	1.4	10	KCN	
		28	1813	12.35	19	21.10	155	1.86	7.15	1.8	1.2	28	1	163	.11	3	0.5	0.5	10	SF5	
		29	926	0.68	19	26.92	155	17.54	17.35	2.7	2.9	22	7	104	.12	2	0.9	0.5	15	DEP L	
		29	942	39.12	19	25.78	155	15.74	14.71	1.6	1.4	41	8	91	.13	3	0.6	0.3	33	DEP	
		29	1334	40.60	19	37.73	155	55.01	18.02	2.6		44	8	193	.14	10	0.6	1.0	36	KCN F	
		29	1439	43.40	19	52.94	155	18.19	10.06	1.1	1.4	21	3	227	.13	4	0.8	0.5	19	KEA	
		29	17	52.39	20	5.23	155	50.56	18.67	1.7	2.0	25	3	236	.12	8	0.9	0.9	24	KOH	
		29	1728	53.01	19	55.24	155	17.05	5.61	0.7	1.5	22	6	252	.11	24	0.6	1.7	18	KEA	
		30	113	54.18	19	21.44	155	28.58	9.73	1.7	1.2	39	4	39	.12	3	0.3	0.5	36	KAO	
		30	817	33.96	19	24.33	155	15.69	3.52	1.8	1.3	29	13	89	.11	2	0.2	0.3	37	SEC	
		30	836	20.61	19	20.92	155	6.02	7.85	2.0	2.0	39	8	99	.13	5	0.4	0.5	32	SF4	
		30	1428	54.85	19	21.13	155	5.59	6.33	1.7	1.7	27	0	96	.11	5	0.6	1.1	25	SF4	
		30	1743	19.92	20	10.10	155	53.00	12.01	2.7	3.0	46	7	295	.08	41	0.4	0.4	41	KOH	
		30	2011	32.63	19	21.72	155	11.93	2.54	1.5	1.2	26	6	78	.10	3	0.4	0.3	20	SBR	
		30	2356	21.33	19	20.97	155	2.64	6.14	1.2	1.4	39	3	143	.13	2	0.4	0.4	39	SF5	
		31	610	13.42	19	19.62	155	12.14	6.46	1.6	1.1	32	5	87	.10	5	0.4	0.7	30	SF3	
		FEB	1	11	69.21	19	20.43	155	12.64	7.55	1.8	1.5	44	10	69	.12	4	0.3	0.5	34	SF2
			1	1433	17.24	19	21.16	155	30.09	9.33	2.3	2.6	44	5	34	.10	5	0.3	0.6	42	KAO

ORIGIN TIME		LAT N		LOW W		DEPTH AMP DIR		GAP RMS MIN ERH		ESZ NO													
YEAR	MON	DA	HR	MM	SEC	DEG	MIN	KM	MAG	MAG	NR	NS	DEG	SEC	DMS	KM	KM	FM	RM	RM	RM		
1988	FEB	1	1557	35.24	20	0.05	155	50.63	13.86	1.4	25	8	206.14	16	0.7	0.4	18	KOH					
		1	1828	5.21	19	12.99	155	27.63	4.51	1.2	33	3	108.16	6	0.4	3.4	31	LSW					
		1	2327	18.98	19	26.07	155	20.42	3.48	2.3	1.5	30	7	73.13	3	0.4	0.6	25	KAO				
		1	2343	26.92	19	25.86	155	20.50	2.00	2.3	1.9	30	8	74.15	3	0.3	0.6	23	KAO				
		2	353	37.45	19	25.23	155	10.70	23.46	1.5	39	6	117.11	6	0.6	0.6	33	DEP					
		2	1035	14.59	19	30.98	155	25.29	22.13	2.8	2.7	63	17	46.12	4	0.4	0.5	47	DEL				
		2	1320	4.20	19	3.44	155	31.91	48.40	32	3	252.12	13	1.6	1.0	31	DL5	T					
		2	1553	37.42	19	20.69	155	11.97	8.21	1.9	1.5	43	6	71.12	4	0.5	0.4	39	SF3				
		2	1815	28.37	19	26.09	155	20.62	2.24	2.1	1.1	22	6	105.11	3	0.3	0.5	11	KAO				
		2	2038	36.47	19	6.20	155	17.34	41.75	1.7	1.7	41	0	208.09	19	1.0	2.2	38	LOI				
		3	351	34.44	19	25.22	155	19.18	6.33	2.4	1.7	34	10	73.11	3	0.3	0.6	23	KAO				
		3	354	31.11	19	13.82	155	32.00	5.98	2.3	2.0	46	6	70.18	4	0.5	0.8	40	LSW				
		3	511	59.52	19	6.09	155	17.80	36.76	2.5	2.4	59	14	203.12	19	0.6	0.5	50	LOI				
		3	1125	2.69	20	0.31	155	37.25	12.04	2.3	1.7	24	4	163.09	17	0.6	0.5	16	KOH				
		3	1331	52.12	19	20.20	157	12.32	15.01	1.9	1.2	5	339.15	136	8.9	15.1	7	D15					
		3	1629	57.47	19	16.35	155	2.61	41.52	2.2	2.0	44	6	269.10	7	1.0	0.6	29	DEP				
		3	2235	20.00	19	20.55	155	12.57	8.44	1.7	1.2	39	4	68.11	4	0.4	0.6	25	SF2				
		4	2	45.23	20	9.44	155	47.07	27.75	2.5	1.8	42	7	291.11	3	0.6	0.6	36	KOH				
		4	424	57.38	19	6.68	155	17.92	36.59	2.3	2.3	51	8	200.11	18	0.9	0.7	47	LOI				
		4	546	28.46	19	21.08	155	6.80	7.57	1.7	1.3	26	3	90.09	4	0.5	0.8	21	SF4				
		4	728	24.50	19	25.26	155	19.56	8.71	2.3	1.9	47	13	48.12	3	0.3	0.4	34	KAO				
		4	1416	44.28	19	19.23	155	9.90	5.12	1.6	1.1	27	3	102.09	5	0.5	1.2	20	SF3				
		4	1656	33.07	19	17.45	155	44.17	16.63	2.0	1.3	15	0	287.09	10	10.3	4.8	8	KCN				
		4	2047	42.18	19	56.98	155	22.84	13.15	2.2	1.7	32	5	190.18	8	0.8	0.4	27	KBA				
		4	2213	24.64	19	18.28	155	14.37	11.59	2.9	2.8	58	10	134.11	6	0.4	0.2	48	SF2	F			
		5	310	3.31	19	20.17	155	10.43	8.05	1.6	1.2	35	4	83.10	4	0.4	0.6	27	SF3				
		5	646	0.22	19	22.04	155	4.23	8.17	1.1	1.3	31	6	91.12	4	0.5	0.5	20	SF5				
		5	2152	59.04	19	15.94	155	21.60	6.92	1.1	25	6	181.09	5	0.5	1.1	20	SAR					
		5	2321	1.00	19	11.54	155	41.81	9.33	2.4	2.1	38	5	124.21	10	0.6	0.5	16	LSW				
		6	017	28.35	19	25.39	155	19.23	7.99	2.2	1.2	29	5	77.12	3	0.4	0.7	22	KAO				
		6	328	38.27	19	24.40	155	30.05	8.38	1.8	1.2	37	1	43.11	6	0.3	1.1	25	KAO				
		6	348	14.92	19	20.44	155	13.40	7.04	1.5	1.1	25	1	62.09	4	0.5	1.0	22	SF2				
		6	458	33.22	19	21.04	155	5.97	7.50	1.7	1.5	28	2	96.12	5	0.6	0.8	21	SF4				
		6	851	49.51	19	18.51	155	27.67	8.90	1.3	36	5	44.13	7	0.3	0.6	32	LSW					
		6	9	4	48.28	19	14.10	155	26.82	10.48	2.4	2.5	51	8	108.18	5	0.4	0.6	43	LSW			
		6	1452	55.69	19	24.04	155	15.84	3.26	2.4	2.2	38	11	72.12	1	0.3	0.2	27	SEC				
		6	17	1	4.64	19	23.76	154	48.40	40.73	2.1	1.9	57	14	268.12	8	1.1	0.6	46	LER			
		6	1810	28.52	19	19.56	155	7.81	9.31	2.3	2.6	52	10	99.14	4	0.4	0.3	43	SF4				
		6	2228	19.17	19	18.44	155	15.43	8.46	1.6	1.2	38	6	117.16	4	0.4	0.5	32	SF1				
		6	2243	39.13	19	19.85	155	6.63	7.87	0.9	1.2	32	4	118.09	5	0.4	0.6	29	SF4				
		7	749	3.56	19	9.87	155	41.10	7.66	2.9	3.0	53	16	127.16	12	0.4	0.8	37	LSW				
		7	1647	41.47	19	25.42	155	49.54	10.18	2.3	1.4	29	4	111.19	11	0.5	0.8	26	KCN				
		7	1813	54.47	20	14.53	156	2.78	18.49	2.6	1.7	21	3	314.10	31	1.0	3.4	18	KOH				
		8	232	45.48	20	7.58	156	0.52	6.12	2.6	1.9	34	5	277.24	24	0.9	1.0	29	KOH				
		8	11	2	33.21	19	20.27	155	12.08	7.75	2.2	1.8	43	2	76.13	5	0.4	0.6	30	SF3			
		8	232	45.48	20	7.58	156	0.52	6.12	2.6	1.9	34	5	277.24	24	0.9	1.0	29	KOH				
		8	232	45.48	20	7.58	156	0.52	6.12	2.6	1.9	34	5	277.24	24	0.9	1.0	29	KOH				
		8	232	45.48	20	7.58	156	0.52	6.12	2.6	1.9	34	5	277.24	24	0.9	1.0	29	KOH				
		8	232	45.48	20	7.58	156	0.52	6.12	2.6	1.9	34	5	277.24	24	0.9	1.0	29	KOH				
		8	232	45.48	20	7.58	156	0.52	6.12	2.6	1.9	34	5	277.24	24	0.9	1.0	29	KOH				

ORIGIN TIME	LAT N	LONG W	DEPTH AMP DUR	GAP RMS MIN ERH	ERZ NO
YEAR MON DA HRMN	SEC	DEG MIN	DEG MIN	KM MAG MAG NR NS DEG SEC DIS	KM KM PM REMK
1988 FEB	8 1349	48.46	19 22.00	155 13.14	3.15 2.1 1.4 31 8 71 .07 1 0.3 0.2 14 SER
9 041	30.44	19 5.20	155 23.12	35.36 2.9 2.7 62 14 196	11 12 0.6 0.5 49 LOI
9 5 9	59.14	19 20.67	155 6.59	8.07 2.0 1.7 47 6 100	11 5 0.4 0.5 41 SF4
9 943	39.43	19 12.18	155 27.98	7.95 1.8 1.2 34 3 107	16 5 0.6 0.9 31 LSW
9 1030	32.83	19 21.72	155 12.14	12.27 2.1 1.6 48 11 94	11 2 0.6 0.3 37 SF3
9 1251	31.15	19 19.33	155 11.63	7.08 2.1 1.4 37 8 98	10 5 0.3 0.7 27 SF3
9 2213	36.04	19 9.98	155 36.47	7.88 1.9 1.2 29 6 104	20 9 0.5 1.3 13 LSW
10 022	35.51	19 20.53	155 11.98	8.75 1.6 1.5 44 6 73	11 4 0.4 0.5 30 SF3
10 326	57.68	19 21.78	155 2.78	8.68 3.1 3.1 58 12 123	10 4 0.4 0.4 40 SF5 F
10 1353	22.01	19 19.88	155 11.68	8.43 2.1 1.7 37 5 86	11 5 0.4 0.5 26 SF3
10 14 7	12.88	19 11.80	155 31.19	37.40 2.0 1.6 43 5 87	08 6 0.5 1.3 32 DIS
11 1 5	30.98	19 20.44	155 13.22	6.96 1.7 1.1 33 4 63	12 4 0.4 0.5 30 SF2
12 1315	50.73	19 43.78	155 2.79	0.00 2.7 3.0 13 2 242	30 5 5.9 3.8 9 HIL B*
12 1952	25.57	19 17.77	155 12.87	7.04 1.2 1.7 39 4 122	13 2 0.5 0.8 26 SF2
12 1954	22.33	19 18.24	155 12.86	3.95 2.1 1.8 35 0 106	08 3 0.3 0.9 20 SSF
12 2155	29.73	19 18.01	155 12.91	10.35 2.5 2.7 49 5 141	13 9 0.4 0.4 35 SF2
12 2248	34.43	19 17.81	155 13.03	10.54 2.6 2.9 58 10 139	11 9 0.4 0.3 48 SF2
12 2342	6.92	19 24.31	155 16.21	3.25 1.0 1.7 2 85	08 1 0.4 0.3 10 SEC
13 121	17.25	19 16.56	155 12.97	10.66 2.2 2.3 60 14 164	17 1 0.4 0.3 46 SF2
13 159	8.03	19 16.66	155 12.97	9.60 2.0 1.1 40 8 163	14 1 0.5 0.6 32 SF2
13 958	38.11	19 22.28	155 20.72	10.81 2.0 1.4 33 6 75	09 3 0.4 0.6 19 KAO
13 1611	52.72	19 21.61	155 4.24	8.54 1.7 1.7 41 8 80	13 4 0.5 0.4 35 SF5
13 1639	45.41	19 17.20	155 12.94	8.13 1.6 1.4 33 5 163	13 1 0.5 0.6 30 SF2
13 1745	58.06	19 13.63	155 26.48	9.31 1.2 2.9 4 120	16 4 0.5 0.8 25 LSW
13 1752	50.73	19 21.72	155 1.24	7.68 1.1 1.2 39 4 164	12 4 0.6 0.4 36 SF5
13 22 7	58.03	19 20.45	155 6.62	8.49 1.7 1.4 45 9 104	12 6 0.4 0.4 39 SF4
14 950	18.74	19 22.60	155 13.36	18.11 2.2 2.4 11 2 287	11 4 2.0 1.0 2 DEP L
14 1540	41.33	19 20.17	155 12.56	8.57 1.6 39 8 74	13 5 0.4 0.4 33 SF2
14 1540	52.72	19 19.78	155 12.53	7.27 1.9 1.5 40 8 79	13 5 0.3 0.5 35 SF2
14 1558	34.36	20 0.34	155 28.32	6.74 2.9 3.3 52 8 193	12 25 0.4 0.7 47 KBA F
14 1650	12.36	19 21.10	155 2.67	6.55 1.4 1.3 44 8 132	18 2 0.5 0.5 36 SF5
15 010	17.49	19 58.72	155 23.85	8.76 2.7 2.6 52 7 195	15 23 0.4 0.7 45 KBA
15 041	22.39	19 29.42	155 12.68	0.02 2.4 2.1 22 7 247	25 9 3.0 1.1 15 CLN L*
15 546	54.26	20 1.01	155 30.44	11.67 1.0 1.5 26 4 195	14 22 0.7 0.5 24 KBA
15 1435	7.19	19 26.78	155 15.88	13.44 2.6 3.4 23 9 166	11 2 1.0 0.6 14 DEP L
15 1455	16.80	19 22.24	155 13.35	12.17 2.2 1.7 12 3 261	24 4 2.0 3.3 1 SF2 L
15 1629	14.96	19 25.75	155 14.52	13.41 2.3 2.5 17 6 274	11 5 0.8 0.4 1 DEP L
15 1749	25.71	19 25.50	155 16.71	9.06 2.1 1.6 14 4 170	11 1 1.2 0.6 3 INT L
15 1845	42.79	19 25.44	155 19.54	9.89 2.3 1.7 14 5 119	09 3 0.8 1.1 1 KAO L
15 20 1	7.04	19 27.23	155 18.66	10.55 2.2 1.8 13 4 200	10 4 1.1 0.6 1 INT L
15 2115	26.20	19 25.08	155 17.10	8.22 2.2 2.0 17 3 151	13 0 0.6 0.8 6 INT L
15 2238	57.76	19 24.57	155 17.13	13.19 2.1 1.8 15 6 83	29 1 2.1 0.9 2 DEP L
16 034	7.96	19 26.13	155 16.32	17.78 2.5 1.9 13 3 243	11 3 3.0 1.4 5 DEP L
16 229	46.79	19 25.35	155 13.72	12.51 2.8 3.3 23 10 202	14 2 1.3 0.5 13 SF2 L
16 3 3	48.22	19 24.01	155 15.80	2.92 2.4 2.6 43 13 44	11 1 0.2 0.2 21 SEC

ORIGIN TIME		LAT N	LONG W	DEPTH AMP DUR	CAP RMS MIN ERH			ERZ NO
YEAR MON DA HRMN	SEC	DEG MIN	DEG MIN	KM MAG MAG NR NS DEG SEC DIS	KM	KM	PM REMK	
1988 FEB	16 1150	9.37	19 26.18	155 14.48	5.15 2.0 1.7 11	5 211	16 5 1.7 6.4	1 INT L
16 1410	38.31	19 25.70	155 18.47	14.22 2.9 3.0 16	5 102	11 2 1.5 0.8	1 DEP L	
16 1545	14.75	19 24.11	155 15.32	2.59 2.6 2.9 9	1 110	13 2 0.6 1.2	0 SEC L	
16 2012	8.72	19 19.71	155 27.48	8.06 2.6 2.7 5	1 335	03 20 3.8 10.3	1 KAO L-	
16 2035	8.85	19 25.30	155 20.29	7.28 2.7 2.8 62 16	47 13	3 0.3 0.4 48	KAO	
17 0 2	18.31	19 23.92	155 15.34	12.44 2.0 1.6 11	2 149	08 2 1.3 0.8	0 INT L	
17 130	1.77	19 25.48	155 15.74	12.99 2.7 3.2 19	8 142	10 2 0.9 0.7	0 INT L	
17 132	2.05	19 25.56	155 18.89	11.29 2.6 2.8 21	12 82	10 2 0.4 0.5	2 INT L	
17 245	24.54	19 25.08	155 17.25	13.06 2.3 2.0 17	4 87	10 1 1.0 0.5	4 DEP L	
17 440	18.75	19 25.29	155 16.63	11.23 2.2 2.0 25	9 106	09 1 0.8 0.6	11 INT L	
17 713	49.17	19 21.91	155 19.84	2.23 2.1 1.9 14	4 115	13 3 0.4 0.7	2 SAR L	
17 8 0	47.00	19 23.20	155 16.45	36.11 2.9 2.2 7	1 134	08 2 4.7 1.4	0 DEP L	
17 917	37.41	19 23.21	155 18.42	0.00 2.4 2.8 6	0 130	14 2 0.4 1.3	2 SSC L*	
17 919	32.98	19 23.67	155 13.75	8.25 2.6 2.5 11	1 177	13 2 0.9 1.1	0 SF2 L	
17 1152	15.90	19 24.97	155 16.25	11.58 2.2 2.0 15	2 106	09 1 1.1 0.8	1 INT L	
17 1313	26.59	19 31.89	155 18.18	12.30 2.9 3.1 12	3 298	08 8 1.6 1.3	2 GEN L	
17 1534	57.62	19 22.45	155 20.48	8.65 2.4 2.5 10	2 266	22 3 2.2 1.8	1 KAO L	
17 1638	0.75	19 27.48	155 14.44	28.54 2.8 2.1 16	3 222	11 4 2.6 1.4	3 DEP L	
17 1718	20.83	19 28.90	155 24.10	9.47 2.0 1.2 48 13	59 13	2 0.3 0.5 35	KAO	
17 1825	43.06	19 25.61	155 15.21	12.65 2.7 2.9 25	8 157	20 2 1.2 0.7	17 INT L	
17 20 1	37.69	19 17.14	155 23.00	14.76 2.6 2.2 22 11	253 19	11 1.5 2.1	11 DEP L	
17 2131	40.31	19 24.60	155 17.00	12.01 2.3 1.8 25	9 83	12 1 0.8 0.5	16 INT L	
17 2252	38.08	19 23.58	155 12.83	12.97 2.3 2.0 14	5 288	17 3 1.9 0.9	9 SF2 L	
18 021	55.75	19 24.84	155 17.86	10.88 2.7 2.9 17	5 79	11 1 1.3 0.6	12 INT L	
18 1 1	2.30	19 20.37	155 13.48	17.24 2.5 1.7 12	3 292	21 4 3.7 1.4	1 DEP L	
18 251	59.21	19 22.32	155 15.31	14.96 2.6 3.0 14	5 234	14 1 1.6 0.9	9 DEP L	
18 448	26.69	19 24.69	155 15.35	11.46 2.3 2.0 18	6 112	11 2 1.1 0.8	2 INT L	
18 555	7.20	19 24.81	155 16.46	13.35 2.3 1.6 16	4 97	11 1 1.4 0.9	4 DEP L	
18 8 9	58.31	19 26.10	155 16.13	14.46 2.3 2.1 23 11	146 09	3 1.3 0.6	3 DEP L	
18 859	40.58	19 22.63	155 18.18	4.27 2.8 3.1 15	4 81	13 3 0.6 1.0	0 SSC L	
18 916	12.66	19 26.38	155 16.02	25.49 2.9 3.1 18	9 189	09 3 2.0 0.9	4 DEP L	
18 1026	58.04	19 25.50	155 15.61	11.43 2.6 2.4 18	6 145	12 3 1.1 0.7	0 INT L	
18 1112	52.94	19 25.27	155 15.98	13.39 2.4 2.1 17	6 124	11 2 1.2 0.8	1 DEP L	
18 1132	25.08	19 6.24	155 8.97	18.90 2.6 2.7 56	8 218	13 21 1.0 2.2	47 LOI	
18 1142	26.72	19 36.52	156 1.85	42.19 2.9 2.2 49	9 228	11 18 0.8 0.5	40 KAN	
18 1151	6.28	19 22.83	155 17.39	7.86 2.6 2.6 21	6 74	14 1 0.6 0.6	1 INT L	
18 1240	1.58	19 22.97	155 18.73	9.15 2.5 1.7 13	3 131	15 2 1.0 1.1	0 INT L	
18 13 1	25.18	19 15.30	155 26.64	8.26 1.7 1.4 23	2 81	11 5 0.4 0.8	11 LSW	
18 1311	56.58	19 24.59	155 17.54	7.78 2.7 2.7 21 4	58 11	1 0.6 0.4	4 INT L	
18 14 0	20.88	19 27.66	155 14.57	12.65 2.7 3.1 15	4 250	14 4 1.4 0.7	1 INT L	
18 1424	23.50	19 23.69	155 17.50	8.84 2.2 1.9 13	3 85	05 1 0.9 0.8	1 INT L	
18 1451	51.48	19 24.59	155 14.19	13.16 2.1 1.8 14	5 157	11 0 1.5 0.7	10 DEP L	
18 15 1	58.34	19 24.86	155 18.64	15.68 2.7 2.5 24	9 101	14 2 1.0 0.7	15 DEP L	
18 15 4	21.16	19 19.76	155 8.00	7.57 2.0 1.9 41	3 90	10 4 0.4 0.6	28 SF4	
18 15 7	37.54	19 25.48	155 16.56	12.14 2.1 1.8 16	7 133	09 1 1.0 0.6	10 INT L	

ORIGIN TIME	LAT N	LON W	DEPTH	AMP	DUR	GAP	RMS	MIN	ERR	DEG	NO																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
YEAR	MON	DA	HRRM	SEC	DEG	MIN	DEG	MIN	NS	DEG	SEC	DIS	KM	KM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM	RM

YEAR	MON	DA	HRRM	SEC	DEG	MIN	LAT	N	DEG	MIN	LON	W	DEPTH	AMP	DUR	RMS	NS	DEG	SEC	DIS	KM	PM	REMARK	
1988	MAR	9	2014	6.39	19	24.39	155	17.04	11.48	2.3	2.4	28	4	48	.13	1	0.5	0.5	25	INT	L			
		9	21	0	43.56	19	25.71	155	16.09	13.25	2.5	1.8	25	8	91	.13	2	0.9	0.6	11	DEP	L		
		9	2128	18.63	19	25.39	155	15.89	16.23	2.3	2.1	19	5	132	.09	2	1.3	0.7	10	DEP	L			
		9	2154	33.21	19	25.09	155	17.01	15.10	2.3	1.9	24	9	93	.13	0	0.9	0.7	10	DEP	L			
		9	2240	12.35	19	25.57	155	15.70	17.34	2.4	2.0	17	2	146	.05	3	1.4	0.9	13	DEP	L			
		10	3	5	36.98	19	11.07	155	36.35	7.26	2.4	1.9	41	6	95	.19	7	0.4	0.9	35	LSW			
		10	6	0	8.00	19	17.29	155	14.03	7.81	1.6	1.1	32	6	147	.11	1	0.4	0.6	27	SF2			
		10	959	50.47	19	25.22	155	17.06	11.63	2.2	2.0	22	6	62	.12	1	0.9	0.6	16	INT	L			
		10	1043	33.21	19	26.13	155	29.06	8.88	2.1	1.7	48	9	42	.12	7	0.3	0.6	41	KAO				
		10	1047	8.81	19	23.71	155	16.40	12.94	2.5	2.7	25	9	64	.25	0	1.6	0.7	16	INT	L			
		10	1051	39.74	19	25.06	155	15.62	15.24	2.5	2.6	18	4	155	.11	2	1.1	0.5	15	DEP	L			
		10	1139	57.74	19	24.32	155	16.40	16.16	2.4	1.6	20	5	83	.16	1	1.4	0.7	15	DEP	L			
		10	1234	35.42	19	24.48	155	16.36	15.46	2.3	1.6	20	5	133	.17	1	1.6	0.8	15	DEP	L			
		10	1345	57.66	19	24.49	155	16.18	10.08	2.2	2.1	21	6	91	.15	1	0.9	0.4	16	INT	L			
		10	1410	48.35	19	25.04	155	17.48	11.68	2.2	1.6	23	6	85	.17	1	0.9	0.6	18	INT	L			
		11	313	38.66	19	23.67	155	16.52	12.83	2.2	1.8	22	4	78	.11	0	0.8	0.5	18	INT	L			
		11	326	41.88	19	18.88	155	14.08	9.38	1.6	1.1	37	8	73	.16	4	0.5	0.5	30	SF2				
		11	445	55.38	19	25.44	155	15.77	10.89	2.2	1.7	23	4	115	.15	2	0.7	0.6	20	INT	L			
		11	521	34.22	19	24.75	155	18.18	15.60	2.2	1.8	19	4	78	.13	2	1.1	0.6	16	DEP	L			
		11	648	23.29	19	24.73	155	16.58	11.23	2.1	1.6	21	4	116	.08	1	0.6	0.4	17	INT	L			
		11	822	57.38	19	20.54	155	11.88	8.09	2.6	2.5	61	13	74	.17	4	0.3	0.4	48	SF3				
		11	858	54.07	20	51.12	155	31.38	14.76	3.2	3.0	31	2	319	.12	85	7.0	10.6	29	DIS	-			
		11	9	1	44.04	19	25.15	155	15.65	10.30	2.2	1.3	18	4	130	.15	2	1.2	0.6	11	INT	L		
		11	926	58.77	19	55.39	155	33.47	20.93	1.5	24	4	144	.07	13	0.7	1.1	19	REK					
		11	945	8.52	19	25.25	155	16.56	12.03	2.2	1.4	37	7	69	.12	1	0.5	0.4	33	INT	L			
		11	1155	39.78	19	25.15	155	18.28	13.04	2.4	1.4	24	7	72	.15	1	1.1	0.6	17	DEP	L			
		11	1316	55.01	19	25.31	155	15.04	9.61	2.0	1.2	21	5	97	.12	2	0.7	0.4	16	INT	L			
		11	1323	30.04	19	9.82	155	41.62	5.17	2.3	2.2	33	5	131	.24	12	0.5	2.7	28	LSW				
		11	1352	1.33	19	22.76	155	17.26	12.36	2.1	1.3	14	3	86	.11	1	1.0	0.9	13	INT	L			
		11	1612	3.00	19	23.82	155	17.16	12.15	2.2	1.9	27	6	56	.13	1	0.7	0.4	21	INT	L			
		11	1637	32.60	19	24.97	155	17.34	11.02	2.1	1.3	25	3	55	.09	1	0.6	0.4	23	INT	L			
		11	1719	8.81	19	23.16	155	17.38	11.04	2.3	1.4	28	6	63	.12	1	0.6	0.6	22	INT	L			
		11	1718	59.96	19	24.92	155	16.56	11.36	2.1	1.5	24	4	98	.12	1	0.7	0.4	21	INT	L			
		11	20	0	3.77	19	24.09	155	17.11	12.15	2.2	1.5	34	6	40	.15	1	0.6	0.3	29	INT	L		
		12	139	53.24	19	24.21	155	17.51	11.57	2.2	1.4	32	6	96	.14	1	0.6	0.4	26	INT	L			
		12	242	54.35	19	23.85	155	16.22	11.62	2.2	1.6	30	6	71	.18	1	0.7	0.4	24	INT	L			
		12	343	0.60	19	24.48	155	17.03	12.00	2.3	1.4	28	6	62	.11	1	0.6	0.3	25	INT	L			
		12	444	47.83	19	24.11	155	16.23	11.25	2.2	1.7	27	6	104	.15	1	0.8	0.4	21	INT	L			
		12	547	17.15	19	24.47	155	16.60	11.26	2.3	1.9	29	4	105	.17	1	0.7	0.4	25	INT	L			
		12	7	6	17.57	19	24.06	155	15.43	11.16	2.3	1.8	30	6	105	.26	2	1.1	0.6	24	INT	L		

YEAR	MON	DA	HHR	MIN	SEC	DEG	MIN	LON	W	DEPTH	AMP	DUR	KM	MAG	WPG	NR	NS	DEG	SEC	DIS	KM	RM	FN	REMARK
1988	MAR	28	028	18.69	19	57.63	156	26.13	29.31	2.9	3.6	43	3	310	10	69	1.2	2.8	42	DIS				
			121	6.56	19	57.27	31.03	3.7	52	7	231	12	73	1.0	2.2	37	DIS							
			125	14.90	19	53.90	156	20.75	0.95	1.7	40	3	281	10	58	2.4	0.8	28	DIS					
			142	15.83	19	56.80	156	25.50	35.17	1.8	21	3	290	10	70	1.7	3.7	9	DIS					
			221	38.55	19	58.39	156	24.00	5.00	3.1	52	9	225	13	67	1.0	1.6	38	DIS					
			339	0.59	19	14.73	155	27.44	8.73	1.5	31	2	88	10	5	0.3	0.6	17	LSW					
			357	13.20	20	0.01	156	35.48	35.23		17	1	323	11	88	4.4	3.5	8	DIS					
			411	50.53	19	54.53	156	20.36	0.49	1.7	28	2	306	11	58	2.7	0.8	19	DIS					
			432	32.37	19	56.76	156	19.97	0.15		31	1	283	08	59	2.4	0.6	19	KOH					
			621	26.99	19	55.65	156	25.24	29.10		14	2	288	08	71	1.8	5.5	5	DIS					
			633	30.62	20	1.42	156	25.86	26.06		33	1	312	10	80	1.6	4.6	20	DIS					
			645	6.30	19	24.43	154	58.88	0.40		12	1	197	09	8	1.1	1.2	5	SLE					
			9	3.82	19	56.65	156	24.52	32.49	3.1	3.5	49	7	226	12	68	0.9	2.0	42	DIS				
			9	16.09	19	52.14	156	22.71	51.19	2.7	3.6	29	5	284	20	60	3.0	2.8	24	DIS				
			1032	55.35	19	52.86	156	15.13	66.04		2.5	19	3	271	16	48	3.3	1.3	16	HUA				
			1110	17.70	19	26.22	155	14.95	15.27	2.1	1.8	9	1	229	07	3	2.0	2.2	1	DEP	L			
			1125	25.52	19	57.15	156	31.68	27.08	2.8	3.3	35	4	295	13	78	1.3	4.3	31	DIS				
			12	8	3.98	20	1.85	156	33.49	32.21		2.7	36	2	316	12	84	1.5	3.0	35	DIS			
			1235	57.35	20	1.72	156	41.15	37.72	3.2	4.2	34	2	316	14	95	1.8	2.4	33	DIS				
			1315	31.10	20	2.18	156	30.78	29.14	2.8	2.9	33	2	315	11	80	1.6	4.0	31	DIS				
			1320	27.93	19	54.88	156	20.54	0.68	3.1	3.3	42	6	306	11	58	2.0	0.6	21	DIS				
			1333	3.36	19	24.71	155	17.40	16.43	2.6	15	3	104	13	1	1.9	1.0	1	DEP	L				
			1537	13.94	19	23.51	155	14.85	10.00	2.3	1.9	22	5	98	12	2	0.8	0.4	19	INT	L			
			1553	51.21	19	59.81	156	30.34	30.66	3.0	48	2	297	13	77	1.2	2.4	46	DIS					
			1610	50.32	19	50.92	156	19.23	60.37		2.6	18	11	53	1.9	2.2	17	HUA						
			1614	2.50	19	59.63	156	29.57	34.38	3.1	3.4	38	3	296	14	76	1.6	2.6	36	DIS				
			1647	13.82	19	24.73	155	16.14	11.40	2.3	1.7	21	5	73	16	2	0.8	0.5	18	INT	L			
			1720	35.99	19	58.07	156	28.00	32.02	3.2	4.1	50	2	232	13	73	1.2	2.2	48	DIS				
			1725	31.61	19	23.10	155	11.49	13.98	2.3	7	1	182	16	3	2.5	5.5	0	DEP	L				
			18	9	3.71	19	25.35	155	15.75	8.57	2.2	0.19	5	102	15	2	0.9	0.4	15	INT	L			
			1854	24.57	19	56.91	156	24.52	41.10		2.6	29	5	289	20	66	2.7	3.8	24	DIS				
			19	7	53.61	19	22.09	155	3.01	8.12	1.7	1.6	36	4	124	15	4	0.5	0.6	33	SFS			
			1919	34.83	20	3.65	156	31.74	28.37	1.9	2.6	36	1	315	12	83	1.4	3.3	36	DIS				
			1931	0.99	19	28.44	155	15.22	10.40	2.4	2.1	17	4	220	13	7	1.6	0.7	13	GIN	L			
			2242	30.80	19	54.32	156	23.40	2.55		13	1	308	07	63	2.3	1.4	4	DIS					
			2317	47.40	19	21.30	155	14.66	0.99	2.3	9	4	199	09	3	0.3	0.2	2	KOA	L				
			2328	57.53	19	51.98	156	12.54	63.89		19	4	265	13	44	1.9	0.9	19	HUA					
			0	8	21.88	19	58.35	156	23.97	29.61	3.8	4.3	55	9	225	12	67	1.0	2.2	43	DIS			
			058	43.94	19	18.95	155	26.48	10.23	2.0	2.4	17	2	69	10	6	0.5	0.9	11	LSW				
			1	57.59	19	20.06	155	20.06	17.44	2.3	2.0	6	1	288	09	8	4.6	3.8	1	DEP	L			
			112	40.55	19	55.16	156	20.22	0.48		1.9	25	3	305	10	58	2.3	0.8	12	DIS				
			337	58.68	19	11.82	155	31.28	37.85	2.5	2.7	47	5	88	08	6	0.5	1.0	38	DIS				
			524	25.98	19	58.53	156	30.91	25.54		26	4	313	12	78	1.8	5.9	19	DIS					
			7	5	23.32	19	58.86	156	29.35	29.93		25	3	295	12	75	1.8	4.5	22	DIS				
			718	25.56	20	0.78	156	39.24	36.27		29	2	314	13	92	1.9	3.0	27	DIS					

YEAR	MON	DA	HHR	SEC	LAT N	DEG	MIN	ION W	DEPTH	AMP	DUR	GAP			RMS	MIN	ERR	EXP	NO											
																			KM	MAG	WPG	NR	NS	DEG	SEC	DIS	KM	RM	FN	REMARK
1988	MAR	29	945	47.80	19	17.34	155	12.77	7.40	1.6	1.2	27	5	175	10	8	0.5	0.9	23	SF2										
		29	954	5.14	19	56.00	156	24.05	4.78	1.8	27	5	288	14	65	1.2	1.7	24	DIS											
		29	1038	1.18	19	21.15	155	8.29	8.59	1.6	1.7	32	4	77	12	3	0.6	0.5	28	SF4										
		29	13	6	28.32	19	12.58	155	40.54	2.85	2.7	43	6	111	19	16	0.5	1.0	37	LSW										
		29	15	9	55.18	19	56.69	156	23.48	35.82	2.3	20	2	288	10	64	2.0	3.4	18	DIS										
		29	1550	57.18	19	52.59	156	13.92	79.48	3.3	13	2	269	11	46	3.1	1.1	12	HUA											
		29	1612	37.17	19	59.49	156	41.84	31.39	2.9	28	3	304	12	96	2.2	4.6	23	DIS											
		29	1747	12.69	19	58.37	156	27.06	30.58	2.8	39	4	293	15	71	1.5	3.3	36	DIS											
		29	2013	45.91	19	59.46	156	30.00	30.00	2.8	34	3	296	13	77	1.6	3.7	33	DIS											
		29	2225	47.55	20	5.62	156	43.42	27.65	2.9	29	0	320	09	114	10.9	4.3	22	DIS											
30	034	44.04	19	24.67	155	17.31	11.75	2.2	16	2	65	11	1	0.7	0.7	2	INT	L												
30	153	55.93	19	22.54	155	27.08	10.25	1.6	1.4	29	2	42	12	1	0.4	0.5	20	KAO												
30	351	43.85	19	59.65	156	26.09	28.09	3.1	4.0	49	3	293	11	70	1.2	2.9	46	DIS												
30	541	48.56	19	56.65	156	19.35	0.57	2.5	25	2	306	10	58	3.2	0.9	17	KOH													
30	547	35.02	19	20.83	155	4.00	5.82		32	1	95	16	3	0.6	1.0	32	SFS													
30	547	36.95	19	20.81	155	4.16	9.03	3.8	4.2	57	14	99	12	3	0.4	0.3	44	SFS	P											
30	621	51.14	19	58.43	156	29.09	25.07	3.8	4.8	59	11	294	12	75	1.1	3.4	48	DIS	P											
30	739	5.49	19	54.35	156	23.63	3.66		17	1	327	11	63	6.6	5.8	10	DIS													
30	752	31.01	19	22.29	155	30.06	8.89	2.0	34	2	46	12	4	0.3	0.6	26	KAO													
30	754	54.33	19	54.03	156	20.90	0.43		25	2	305	12	58	3.5	1.0	15	DIS													
30	837	47.18	19	46.10	156	8.41	0.04		9	1	304	10	33	3.4	1.4	3	HUA	*												
30	9	6	49.21	19	47.26	156	10.14	17.65	2.8	3.3	26	2	290	15	42	1.6	15.5	15	HUA	-										
30	1040	28.65	19	11.81	155	28.83	33.39	2.3	42	6	84	09	5	0.6	0.6	37	DIS													
30	1110	17.36	19	54.33	156	26.33	1.00		25	3	289	15	67	2.3	0.9	23	DIS													
30	1228	8.80	19	44.03	155	1.81	0.00	2.4	24	1	246	30	6	3.9	1.4	24	HIL	B												
30	13	2	40.99	19	22.76	155	3.01	8.21	2.2	2.4	42	6	120	17	3	0.5	0.4	36	SFS											
30	2143	21.18	19	55.02	156	22.90	45.46	2.5	21	2	285	11	62	2.2	2.3	21	DIS													
30	2353	34.42	19	28.65	155	17.85	12.99	2.0	2.1	13	2	239	15	3	1.4	1.0	4	GLN	L											
31	246	51.62	19	55.53	156	23.01	2.41	4.4	6.49	2	224	10	67	0.9	1.1	47	DIS	P												
31	426	48.27	19	42.21	155	51.09	71.67	2.4	11	4	277	16	2	6.1	2.8	7	HUA	*												
31	5	40.78	19	25.49	155	29.40	10.06	2.7	2.9	54	14	37	11	6	0.3	0.4	44	KAO												
31	534	36.97	19	19.47	155	17.33	8.00	1.8	1.6	21	4	169	17	1	1.0	0.8	18	SMR												
31	538	0.62	19	19.95	155	12.02	6.99	2.0	2.3	45	6	112	15	5	0.4	0.5	42	SF3												
31	819	50.44	19	22.10	155	5.81	8.28	1.7	1.4	13	1	93	08	4	0.6	1.0	12	SF4												
31	1128	13.12	19	49.37	156	12.49	73.18		17	4	295	21	41	3.1	1.4	13	HUA													
31	1228	53.69	19	56.63	156	31.24	3.50	3.4	48	6	237	12	77	1.5	1.1	42	DIS													
31	1329	3.59	19	46.64	156	16.46	64.02		22	3	270	17	47	2.8	1.4	19	HUA													
31	1447	4.60	19	44.45	156	26.22	51.21	3.2	4.1	36	5	295	23	61	2.7	2.6	31	DIS												
31	1616	18.45	19	52.60	155	18.14	41.44	2.1	2.0	39	3	194	10	5	0.8	1.3	35	KEA												
31	2144	14.26	20	5.41	156	12.39	45.26	3.1	3.4	48	14	198	20	45	0.8	1.3	37	KOH												
31	2257	29.65	19	45.14	156	3.07	79.53	2.4	15	4	307	20	23	6.8	1.2	11	HUA													
APR	31	2317	8.53	19	57.30	156	17.30	69.37	2.3	16	1	304	21	67	9.9	4.8	6	KOH												
	1	056	21.06	19	22.15	155	3.95	8.10	2.0	2.0	30	4	100	14	4	0.5	0.4	23	SFS											
	1	127	46.28	19	11.98	155	31.30	38.43	2.3	2.3	42	6	85	07	6	0.5	0.8	37	DIS											
	1	349	38.99	19	15.97	155	37.49	9.47	2.1	2.1	39	5	68	11	5	0.3	0.5	23	LSW											

YEAR	MON	DA	HR	MIN	SEC	ORIGIN TIME	LAT N	DEG	MIN	LONG W	DEPTH	AMP	DUR	KM	MAG	W	NS	DEG	SEC	DIS	KM	RM	FM	REMARK	
1988	APR	1	730	49.83	19	23.90	155	15.39	3.10	1.8	1.3	17	6	78	.09	2	0.3	0.5	7	SEC					
		1	944	39.77	19	53.70	156	12.61	51.03	3.7	4.4	63	19	205	.11	45	0.6	1.0	44	HUA	F				
		1	10	5	43.29	19	55.98	156	26.17	11.44	2.7	2.2	25	1	310	.10	68	5.9	8.9	17	DIS				
		1	1134	51.00	19	57.45	156	27.19	26.32	2.1	1.3	1	330	.08	88	4.4	9.1	8	DIS						
		1	1236	8.06	20	3.32	156	33.63	26.81	2.9	2.1	24	1	317	.10	92	3.0	6.5	20	DIS					
		1	1848	10.20	19	54.94	156	23.24	31.50	4.9	5.1	59	9	225	.12	68	1.0	2.0	50	DIS	F				
		1	2018	46.15	19	55.08	156	22.93	30.07	2.7	3.1	35	2	224	.11	67	1.3	3.5	33	DIS					
		1	2020	0.16	20	1.47	156	29.39	29.71	2.8	2.8	31	1	314	.09	78	1.6	3.5	30	DIS					
		1	2148	31.59	19	33.83	155	57.13	14.51	2.3	1.4	26	6	235	.19	9	1.0	4.0	20	KON					
		2	115	33.65	19	22.47	155	50.81	4.27	2.5	2.3	34	5	137	.13	12	0.4	2.4	32	KON					
		2	410	22.69	19	54.31	156	22.61	5.11	2.7	3.0	46	5	223	.13	61	1.2	1.2	40	DIS					
		2	621	59.72	19	55.46	156	23.37	5.31	2.7	2.2	41	5	286	.13	63	1.5	2.2	37	DIS					
		2	1159	29.51	19	24.60	155	16.86	9.12	2.0		23	8	112	.10	1	0.7	0.6	10	INT	T				
		2	1316	27.63	19	11.96	155	31.15	38.17	2.5	2.3	44	9	85	.07	6	0.5	0.7	34	DIS					
		2	1513	26.26	19	58.34	156	27.58	34.47	2.7	2.7	5	232	.10	85	1.4	3.6	19	DIS						
		2	1625	40.00	19	24.02	155	15.84	2.73	2.4	2.5	30	8	76	.11	1	0.3	0.3	23	SEC					
		2	1733	49.93	19	59.07	156	29.11	31.08	2.9	3.5	6	313	.11	81	1.3	3.9	28	DIS						
		2	1818	32.62	19	15.10	155	26.42	5.19	1.9	1.5	25	5	86	.19	4	0.5	1.3	17	LSW					
		2	1950	18.17	19	26.63	155	15.43	12.99	2.2	2.2	11	3	196	.11	3	2.0	1.0	1	INT	L				
		2	2011	18.53	19	25.25	155	19.55	6.90	2.2	1.7	29	8	70	.12	3	0.4	0.9	20	KAO					
		2	2047	47.47	19	55.12	156	26.39	32.71	3.0	3.9	50	6	289	.17	68	1.6	2.8	44	DIS					
		2	2334	57.84	19	21.75	155	30.16	9.56	2.0	1.6	27	3	48	.09	5	0.4	0.7	24	KAO					
		3	110	22.76	19	25.35	155	16.84	4.84	1.9	2.0	11	0	102	.14	1	0.8	1.1	0	SNC	L				
		3	220	29.69	19	19.36	155	11.89	8.08	1.6	1.5	31	4	119	.13	5	0.5	0.6	29	SF3					
		3	336	56.74	19	20.64	156	3.08	36.05	2.0	3.1	1	256	.09	21	2.1	0.9	31	KON						
		3	7	31.16	19	25.57	155	11.75	24.29	2.5	2.1	11	1	268	.08	5	2.8	1.0	2	DEP	L				
		3	857	24.95	19	21.75	155	14.27	13.94	2.2	1.8	11	2	190	.14	3	1.6	1.6	1	DEP	L				
		3	952	14.04	19	20.09	155	12.03	7.65	2.0	2.1	46	3	110	.14	5	0.4	0.5	32	SF3					
		3	955	7.18	19	20.73	154	59.72	0.00	2.2	2.2	44	8	197	.20	6	0.9	0.4	36	SLE	*				
		3	10	38.52	19	24.84	155	18.10	13.37	2.3	1.8	18	3	68	.16	1	0.8	0.7	4	DEP	L				
		3	1220	39.10	19	29.32	155	15.32	20.76	2.3	2.2	11	1	270	.07	4	3.5	1.5	0	DEP	L				
		3	1329	34.40	19	21.43	155	0.55	5.48	0.8	1.3	33	5	189	.20	5	0.7	0.7	28	SF5					
		3	1411	4.18	19	24.41	155	17.02	10.36	2.2	1.9	20	2	59	.13	1	0.7	0.6	19	INT	L				
		3	2021	50.50	19	24.52	155	18.10	14.10	2.1	1.9	9	1	106	.07	2	1.5	1.0	0	DEP	L				
		3	2132	13.65	19	22.41	155	16.90	12.15	2.1	1.8	16	3	100	.11	2	0.7	0.6	2	INT	L				
		3	2145	19.12	19	24.86	155	17.08	9.90	2.2	2.1	18	5	101	.08	0	0.7	0.3	15	INT	L				
		3	2160	27.67	19	24.64	155	16.55	11.50	2.3	2.0	19	4	67	.10	1	0.7	0.5	17	INT	L				
		3	2212	54.33	19	19.54	155	8.37	7.65	1.7	1.4	37	7	92	.14	4	0.4	0.5	32	SF4					
		3	2332	46.45	19	25.16	155	15.19	12.02	2.1	2.2	20	6	148	.15	2	1.2	0.6	15	INT	L				
		4	131	20.96	19	20.81	155	13.48	7.04	1.5	1.2	31	5	117	.14	3	0.5	0.6	25	SF2					
		4	317	30.68	19	18.71	155	25.99	9.69	2.3	2.7	46	6	60	.13	5	0.3	0.4	41	LSW					
		4	451	18.65	19	24.10	155	16.13	3.14	2.3	1.9	24	7	70	.08	1	0.3	0.3	16	SEC					

YEAR	MON	DA	HR	MIN	SEC	ORIGIN TIME	LAT N	DEG	MIN	LONG W	DEG	MIN	DEPTH	AMP	DUR	KM	MAG	W	NS	DEG	SEC	DIS	KM	RM	FM	REMARK		
1988	APR	4	923	3.20	19	27.14	155	15.16	16.91	2.3	1.7	17	4	201	.12	3	1.7	0.7	4	DEP	L							
		4	1138	44.75	19	27.83	155	12.22	16.45	2.1	2.0	11	2	292	.08	8	2.2	0.8	1	DEP	L							
		4	1922	12.14	20	15.29	156	28.84	6.71	3.6	3.7	52	10	233	.19	62	0.8	1.2	50	DIS								
		4	2225	30.98	19	56.35	156	23.97	32.34	1.9	3.1	2	288	.12	65	1.7	3.1	29	DIS									
		5	1224	47.07	19	20.41	155	11.64	8.50	2.3	2.8	53	10	101	.15	4	0.4	0.3	46	SF3								
		5	19	0	0.11	19	56.30	156	25.68	8.59	3.5	4.1	54	14	228	.12	71	1.0	1.6	36	DIS							
		5	2128	43.06	19	23.95	155	0.85	8.70	2.4	2.5	48	6	147	.12	4	0.5	0.3	35	SF5								
		6	225	26.68	19	20.74	155	11.86	8.93	2.3	2.6	51	6	102	.13	4	0.5	0.4	46	SF3								
		6	829	2.24	19	20.07	155	7.45	7.63	1.7	3.1	7	98	.10	5	0.4	0.5	27	SF4									
		6	844	29.12	19	19.39	155	11.86	6.71	1.7	3.7	5	119	.14	6	0.4	0.7	32	SF3									
		6	9	3	16.56	19	19.33	155	16.26	32.37	1.9	53	10	124	.11	2	0.7	0.5	43	DEP								
		6	1116	51.34	19	35.01	155	6.58	1.45	2.0	1.4	50	11	72	.12	10	0.3	0.4	39	HIL								
		6	1152	17.26	19	21.30	155	4.60	8.44	1.6	3.3	8	88	.14	4	0.7	0.5	30	SF5									
		6	1342	33.63	19	57.60	156	25.80	39.31	2.8	2.7	34	5	291	.14	69	2.2	3.0	29	DIS								
		6	23	1	4.70	20	0.02	156	31.21	28.44	2.5	40	5	314	.11	79	1.4	3.8	31	DIS								
		7	1	51.78	19	18.78	155	14.70	7.56	1.5	1.2	32	3	142	.11	5	0.5	0.6	30	SF1								
		7	315	3.02	19	36.33	156	11.37	38.00	1.8	3.2	3	281	.13	31	2.6	1.1	31	KON									
		7	557	27.02	19	16.89	155	26.49	9.55	2.4	2.8	43	5	55	.14	6	0.3	0.5	39	LSW								
		7	711	44.85	19	17.45	155	30.74	7.26	2.2	1.7	46	5	55	.15	5	0.3	0.6	41	LSW								
		7	1528	35.22	19	21.88	155	26.66	10.38	2.3	2.4	42	5	45	.12	2	0.3	0.4	27	KAO								
		7	1654	57.95	19	30.67	155	48.66	8.55	2.0	1.5	23	2	94	.13	5	0.6	0.4	16	KON								
		7	2344	8.32	19	28.44	155	27.85	2.05	2.2	1.2	35	7	70	.13	7	0.3	0.6	29	KAO								
		8	252	35.14	19	20.44	155	8.97	7.97	1.6	1.7	43	5	77	.12	3	0.5	0.4	40	SF4								
		8	342	4.41	19	21.72	155	4.81	9.06	1.7	1.7	49	9	80	.14	5	0.4	0.3	42	SF5								
		8	711	5.23	19	27.77	155	37.09	8.16	2.1	2.5	19	0	87	.15	2	0.6	1.1	21	MILO	L							
		8	1531	37.65	19	29.96	155	27.14	5.44	2.3	1.8	42	9	58	.13	4	0.3	1.1	28	KAO								
		9	6	5	18.33	19	21.86	155	13.04	3.16	1.4	1.2	28	5	101	.12	1	0.4	0.3	23	SER							
		9	920	4.45	19	20.65	155	11.02	7.29	2.1	1.8	25	1	112	.12	3	0.5	0.7	24	SF3								
		9	16	4	28.23	19	23.17	155	26.51	10.51	1.6	1.4	38	4	31	.14	2	0.4	0.4	35	KAO							
		9	1746	17.79	19	57.00	156	23.93	30.81	4.0	4.8	48	1	225	.13	65	1.6	2.9	47	DIS								
		9	19	2	26.87	19	29.35	155	26.92	5.67	1.6	1.2	24	4	82	.10	5	0.3	1.4	21	KAO							
		10	122	34.18	19	58.93	156	30.28	0.70	1.5	28	2	296	.15	77	6.3	2.1	26	DIS									
		10	127	10.31	19	46.37	154	56.43	44.40	2.3	1.9	54	12	233	.13	12	0.7	0.8	43	HIL								
		11	035	3.39	19	57.34	156	23.52	4.39	1.6	32	4	309	.11	65	1.3	1.4	28	DIS									
		11	110	55.26	19	16.77	155	23.61	0.00	2.3	3.2	62	14	103	.18	5	0.3	0.2	47	SAR								
		11	112	59.77	19	15.47	155	22.54	11.50	1.7	1.8	27	5	139	.10	3	0.5	0.6	24	SAR								
		11	128	4.33	19	15.89	155	23.07	4.29	2.2	2.7	41	2	141	.12	3	0.4	1.2	43	SAR								
		11	244	35.87	19	25.50	155	29.70	9.57	1.3	42	5	37	.14	7	0.3	0.7	38	KAO									
		11	3	1	0.69	19	21.78	155	28.07	9.59	1.7	1.2	38	4	39	.12	2	0.3	0.4	34	KAO							
		11	311	20.65	19	32.00	155	20.08	14.01	2.1	1.3	44	13	97	.14	7	0.5	0.3	31	IDL								
11	4	8	49.63	19	23.70	155	2.53	8.15	1.7	1.4	29	2	116	.16	3	0.6	0.9	28	SF5									

YEAR	MON	DA	HRVN	SEC	DEG	LAT N	LOX W	DEPTH	AMP	DUR	KM	MAG	MAG NR	NS	DEG	SEC	DIS	KM	RM	FM	ROCK
ORIGIN	TIME																				
1988	APR	11	1031	5.81	19	58.08	156 23.17	1.54	1.9 36	9 289	.12 65	3.1	1.3	21	D1S						
		11	12	5 32.92	19	8.46	155 26.54	30.52	1.9 16	4 195	.18	3	1.7	1.4	12	D1S	L				
		12	045	23.70	19	19.82	155 9.95	7.23	1.6 12.35	4 115	.12	4	0.4	0.6	33	SF3					
		12	437	30.90	19	19.16	155 9.95	8.01	1.9 1.7 39	6 128	.11	5	0.4	0.5	37	SF3					
		12	1044	36.46	19	20.10	155 11.73	6.14	2.1 57.14	10.75	.14	5	0.3	0.5	45	SF3					
		12	1053	51.52	19	54.38	156 23.92	0.08	2.7 2.9 49	7 286	.13	63	2.6	0.7	38	D1S	*				
		12	1244	7.70	19	19.74	155 6.80	8.05	2.0 1.9 34	7 118	.09	5	0.5	0.6	25	SF4					
		13	118	27.37	19	54.94	156 33.15	38.82	3.4 4.3 45	7 243	.15	79	1.3	1.9	40	D1S					
		13	423	56.46	19	50.63	155 48.70	16.06	2.4 2.1 28	6 176	.10	16	0.5	0.6	23	H1A					
		13	1813	30.98	19	20.62	155 12.17	7.66	2.1 2.0 47	4 105	.13	4	0.4	0.6	32	SF3					
		13	2228	4.19	19	23.18	155 30.74	9.79	1.1 36	3 49	.10	6	0.3	0.6	36	K1O					
		14	045	7.70	19	39.52	155 58.83	41.69	1.5 35	3 251	.09	15	1.3	0.7	32	H1A					
		14	349	6.03	19	55.64	156 24.64	2.52	1.8 36	5 288	.09	65	1.5	0.9	31	D1S					
		14	8	14.59	19	35.38	155 41.32	32.73	2.0 2.2 40	4 223	.13	12	2.0	0.6	17	K1A					
		14	819	43.77	19	21.22	155 6.81	7.54	1.8 1.4 36	7 87	.14	4	0.5	0.6	29	SF4					
		14	1153	17.60	19	54.16	156 20.13	0.22	3.2 3.8 51	4 281	.10	57	1.9	0.4	37	D1S					
		14	2117	45.25	19	19.82	155 11.74	5.44	1.5 1.1 34	5 131	.13	5	0.4	1.1	30	SF3					
		15	041	47.40	19	22.16	155 3.55	8.11	2.0 1.7 44	4 100	.10	4	0.5	0.4	41	SF5					
		15	644	36.00	19	19.70	155 11.46	6.79	1.7 1.7 50	10 121	.13	5	0.3	0.5	41	SF3					
		15	758	45.92	19	59.75	156 28.98	11.71	3.3 3.7 51	5 233	.12	75	1.3	1.6	46	D1S					
		15	814	15.79	20	3.27	156 29.59	37.80	2.1 23	2 319	.08	80	1.8	4.8	21	D1S					
		15	1013	27.57	19	52.59	156 16.33	23.28	2.6 28	3 273	.15	50	1.9	3.2	25	H1A					
		15	1835	17.38	19	53.73	156 22.18	6.95	3.1 3.7 47	9 223	.12	65	1.1	1.7	39	D1S					
		15	1841	21.70	19	53.86	156 22.37	7.24	3.0 3.4 42	6 223	.13	66	1.8	2.5	33	D1S				</	

YEAR	MON	DA	HR	TIME	LAT		LON		DEPTH	APR		MAY		JUN		CAP	RMS		MIN	ERR	EPR	NO
					SEC	MIN	DEG	MIN		DEG	MIN	DEG	MIN	DEG	SEC		DIS	RM				
1988	APR	19	627	11.18	19	49.62	156	10.94	25.75	1.9	21	3	294	1.1	39	1.5	2.8	20	HIA			
19	958	24.66	19	25.62	155	37.97	0.01	2.1	2.2	30	7	99	23	4	0.4	0.4	23	MLO				
19	1940	44.33	19	23.93	155	26.89	9.55	2.5	2.9	56	11	27	13	3	0.3	0.5	39	KAO				
19	20	6	41.83	19	20.10	155	7.98	8.52	2.0	2.0	42	4	87	09	5	0.4	0.5	25	SFP			
20	236	1.93	19	19.70	155	17.32	33.89	1.4	24	4	135	09	1	0.8	0.8	20	DEP					
20	545	5.69	19	25.46	155	17.32	17.77	2.3	2.1	10	1	121	15	1	1.8	1.4	8	DEP	L			
20	739	42.20	19	50.29	155	44.56	11.03	2.8	3.4	29	1	231	11	20	1.4	0.6	18	HIA				
20	811	39.32	19	54.75	155	46.06	15.02	2.3	2.0	21	1	277	11	13	2.7	0.8	21	HIA				
20	859	59.38	19	59.98	156	24.31	4.26	2.9	3.1	50	4	225	11	67	0.8	1.3	46	DIS				
20	1139	0.28	19	19.08	155	29.29	9.29	2.9	3.1	53	10	39	13	7	0.3	0.5	43	KAO				
20	1244	44.11	19	54.29	156	21.42	10.55	2.0	2.7	3	326	11	59	8.1	11.3	25	DIS	-				
20	1630	6.94	19	23.96	155	14.50	16.02	2.2	1.6	18	2	98	12	1	1.0	0.4	0	DEP	L			
21	136	40.65	19	20.23	155	12.75	8.37	2.2	1.7	54	9	119	13	4	0.3	0.3	47	SF2				
21	429	13.64	19	54.88	155	36.29	11.91	1.1	1.4	25	4	231	08	8	0.9	0.4	21	KEA				
21	552	41.54	19	54.68	155	35.91	11.89	1.1	1.6	30	3	133	11	9	0.7	0.3	28	KEA				
21	1053	41.56	19	20.22	155	12.61	8.34	2.5	2.7	57	9	111	14	5	0.4	0.3	49	SF2	P			
21	1216	13.41	19	28.37	154	53.84	1.58	2.2	1.9	33	0	116	19	3	0.5	0.9	33	SLE				
21	1747	32.77	19	17.24	155	19.57	7.19	1.2	2.3	2	134	07	2	0.5	1.0	15	SAR					
21	1819	57.28	19	19.47	155	12.80	8.71	1.9	1.5	47	5	81	14	5	0.4	0.3	43	SF2				
22	346	0.84	19	21.70	155	2.86	8.10	1.7	1.3	42	5	128	14	3	0.5	0.3	39	SF5				
22	416	37.00	19	27.18	155	14.61	9.33	2.0	1.7	17	3	219	16	4	1.3	0.9	14	INT	L			
22	1030	41.78	19	56.01	155	36.52	12.08	1.3	22	5	138	19	10	0.6	0.6	17	KOH					
22	1245	31.43	19	55.91	156	24.31	4.34	2.5	48	6	288	11	65	0.9	1.0	42	DIS					
22	15	8	43.17	19	27.6																	

ORIGIN TIME		LAT N	LONG W	DEPTH ANP DLR	CAP RMS MIN ERH		ERZ NO
YEAR MON DA HRMN SEC	DEG MIN	DEG MIN	DEG MIN	KM MAG MAG NR NS DEG SEC DIS	KM	KM PM RWK	
1988 MAY 9 1844	31.07 19 27.58	155 51.75	6.98 2.1 1.2 28	3 122 .12	7 0.5	0.7 17 KAN	
10 851 58.80	19 10.07	155 36.03	5.94 2.2 1.4 36	4 105 .13	9 0.5	1.3 32 LSW	
10 9 4 0.13	19 23.78	155 16.24	2.94 1.4 1.3 13	6 137 .14	1 0.6	0.3 9 SEC	
10 1928 38.06	19 25.12	155 29.56	9.15 2.0 1.4 34	2 39 .11	6 0.4	0.8 22 KAO	
10 2357 13.86	19 22.89	154 59.84	7.69 1.8 1.2 34	4 182 .13	5 0.8	0.5 31 LER	
11 724 44.50	19 21.07	155 3.55	6.73 1.7 1.3 26	6 105 .08	2 0.4	0.7 12 SF5	
11 1314 18.08	19 46.96	155 31.33	23.10 4.3 4.6 67	17 92 .10	7 0.4	0.9 50 KEA F	
11 1317 57.37	19 46.81	155 31.22	23.94 2.5 2.4 41	9 91 .09	6 0.5	0.8 32 KEA	
11 1322 16.22	19 47.44	155 31.19	23.91 2.7 2.5 53	12 94 .09	7 0.4	0.8 45 KEA	
11 1324 48.37	19 39.49	155 6.66	6.99 2.4 2.9 11	0 170 .14	10 2.5	12.5 11 HIL B-	
11 1327 20.91	19 47.33	155 31.04	23.23 2.5 2.1 46	10 94 .08	6 0.5	0.9 37 KEA	
11 1341 38.61	19 46.91	155 31.11	21.96 3.9 3.7 69	19 91 .11	6 0.3	0.8 51 KEA F	
11 1556 41.32	19 47.22	155 31.39	23.73 2.5 2.6 56	8 93 .10	7 0.4	0.9 43 KEA	
11 1723 20.18	19 25.00	155 15.29	32.47 1.9 2.1 22	0 113 .08	2 1.1	2.8 7 DEP L	
11 2024 55.24	19 22.23	155 26.49	10.11 1.6 1.2 31	1 39 .12	2 0.4	0.6 17 KAO	
12 744 1.33	19 29.18	156 28.22	6.28 1.5 32 7 282 .13	58 1.3	1.4 27 DIS		
12 926 22.71	19 29.39	155 26.90	1.86 1.6 1.1 25 7 98 .11	5 0.3	0.7 18 KAO		
12 935 29.15	19 22.33	155 30.33	9.11 1.7 1.4 41 6 43 .11	5 0.3	0.5 36 KAO		
12 10 6 14.92	19 51.74	155 23.10	31.66 2.1 1.7 41 2 145 .10	5 1.2	1.0 40 KEA		
12 1137 5.11	19 15.94	155 32.08	12.95 1.8 1.4 28 7 56 .18	4 0.5	0.8 21 LSW		
12 1216 56.59	19 19.63	155 11.49	6.66 1.6 1.1 29 3 92 .09	5 0.4	0.9 19 SF3		
12 1315 59.75	19 21.10	155 29.67	10.34 2.0 1.9 36 4 45 .09	4 0.3	0.7 30 KAO		
12 2137 20.32	19 16.34	155 21.07	6.17 1.6 1.7 23 0 140 .12	6 0.6	1.5 17 SAR		
13 913 23.35	19 18.98	155 48.32	9.94 2.0 1.5 33 4 139 .15	9 0.5	0.6 30 KAN		
13 2226 50.56	19 25.53	154 52.12	11.43 2.6 2.6 46 9 218 .11	4 0.8	0.4 37 LER		
13 2245 37.95	19 25.53	154 52.64	10.31 1.9 1.5 27 3 205 .10	4 1.0	0.5 20 LER		
14 044 9.85	19 25.70	154 52.92	10.46 1.9 1.5 23 2 197 .09	4 0.9	0.6 14 LER		
14 840 48.24	19 27.15	155 29.50	9.60 2.0 1.6 29 5 60 .10	8 0.3	0.8 22 KAO		
14 2033 27.73	19 54.63	156 24.46	7.39 2.1 22 2 326 .09	81 8.3	11.1 16 DIS		
14 2244 42.92	19 21.97	155 0.24	7.67 1.8 1.3 25 0 183 .14	6 1.0	1.1 13 SF5		
15 9 3 13.19	19 50.25	155 32.85	22.97 2.0 1.6 30 4 152 .11	11 0.8	1.1 26 KEA		
15 1742 11.03	19 21.38	155 24.47	13.53 1.6 1.2 23 4 64 .09	6 0.5	0.7 17 DEP		
15 2129 15.32	19 18.33	155 12.72	10.07 2.1 1.9 44 7 131 .11	8 0.3	0.5 31 SF2		
16 052 9.33	19 18.24	155 12.99	9.70 2.2 38 2 139 .11	8 0.5	0.6 33 SF2		
16 714 42.88	19 19.53	155 10.52	7.70 1.6 1.4 24 3 97 .09	5 0.6	0.9 13 SF3		
16 948 16.72	19 17.31	155 13.08	6.04 1.3 15 1 143 .08	1 0.6	1.2 10 SF2		
16 2032 2.32	19 19.76	155 9.85	7.05 1.6 1.2 36 7 89 .09	4 0.3	0.5 32 SF3		
16 2040 3.01	19 24.56	155 16.54	11.13 2.1 1.7 21 4 113 .09	1 0.9	0.6 17 INT L		
16 2349 27.55	19 25.55	155 16.71	9.17 2.1 2.0 25 5 68 .11	1 0.6	0.6 17 INT L		
17 1 4 58.12	19 24.24	155 16.04	2.25 2.2 1.9 26 10 83 .11	1 0.2	0.2 13 SEC		
17 638 44.36	19 25.80	155 17.80	9.89 1.5 1.2 13 2 80 .15	4 1.0	1.2 9 INT L		
17 1440 25.10	19 20.50	155 10.74	7.76 2.0 1.8 36 6 77 .11	3 0.5	0.6 19 SF3		
17 1445 15.32	19 50.50	156 30.40	1.10 2.7 2.1 35 4 290 .12	73 4.8	1.6 14 DIS		
17 2225 59.78	19 19.26	155 8.63	8.37 1.8 1.9 48 9 83 .11	4 0.4	0.3 39 SF4		
18 2217 24.45	19 18.52	155 24.49	8.86 1.9 1.9 39 7 75 .10	4 0.4	0.5 33 SAR		

ORIGIN TIME	LAT N	LONG W	DEPTH ANP DLR	CAP RMS MIN ERH	ERZ NO
YEAR MON DA HRMN SEC	DEG MIN	DEG MIN	KM MAG MAG NR NS DEG SEC DIS	KM	KM PM RWK
1988 APR 25 1558 35.91	20 1.00	156 25.52	33.62 2.0 12 1 312 .05 71 2.4 5.4 4 DIS		
26 138 27.37	19 14.73	155 26.71	36.51 1.4 27 7 94 .22 5 1.2 1.0 20 DIS L		
26 1123 11.72	19 58.99	156 28.59	6.62 3.1 3.4 55 9 233 .15 74 1.2 1.6 48 DIS		
26 1329 24.34	19 18.72	155 26.03	9.78 1.7 1.9 40 7 60 .14 6 0.3 0.5 35 LSW		
26 2115 18.31	19 26.84	155 28.75	9.58 2.5 2.0 57 12 44 .12 7 0.3 0.4 46 KAO		
27 450 49.87	19 20.83	155 11.31	9.44 2.6 2.9 55 9 135 .15 3 0.5 0.3 49 SF3		
27 5 4 16.91	19 24.29	155 29.72	9.48 1.7 1.2 41 6 42 .11 5 0.3 0.5 37 KAO		
27 12 5 24.89	19 19.76	155 7.54	8.31 2.7 2.9 62 16 102 .12 5 0.3 0.4 49 SF4		
27 1620 39.92	19 53.64	155 22.41	8.00 1.4 7 1 195 .07 3 2.3 2.4 3 KEA		
28 1930 49.24	20 3.73	155 21.85	12.59 2.3 1.9 16 0 264 .10 19 3.2 0.6 7 KEA		
28 2119 33.48	19 22.34	155 30.16	8.73 1.7 1.5 40 4 46 .12 4 0.4 0.5 38 KAO		
28 2153 58.67	19 45.12	155 58.49	21.88 4.0 4.5 63 11 178 .13 16 0.6 1.3 53 HUA F		
29 112 39.59	19 25.71	155 20.05	7.98 2.1 1.2 48 15 57 .12 4 0.3 0.4 33 KAO		
29 529 23.70	19 17.11	155 30.41	7.33 1.7 1.3 44 4 48 .21 4 0.5 1.0 40 LSW		
29 1727 39.46	19 25.74	155 30.42	11.48 2.3 1.4 41 7 39 .10 5 0.3 0.6 30 KAO		
30 447 41.87	19 20.13	155 7.40	7.88 2.0 1.9 46 10 98 .11 5 0.3 0.4 33 SF4		
30 1930 4.18	19 59.59	156 29.45	4.74 4.0 4.5 72 22 234 .11 76 0.9 1.1 50 DIS		
MAY 1 043 4.26	19 14.69	155 33.76	10.76 2.6 2.5 54 15 73 .12 6 0.3 0.5 35 LSW		
1 3 0 46.01	19 28.93	155 27.69	8.00 2.7 1.8 58 16 61 .13 6 0.3 0.6 44 KAO		
1 2117 23.12	20 0.85	156 30.37	6.80 1.8 22 3 314 .10 85 8.2 10.6 19 DIS		
2 256 8.58	19 20.22	155 11.28	7.91 2.1 1.8 45 5 81 .13 4 0.4 0.7 35 SF3		
2 318 22.71	19 21.33	155 23.66	8.95 1.6 1.4 39 4 42 .13 2 0.4 0.4 35 SAR		
2 2345 1.76	19 22.90	155 33.17	6.46 2.5 2.4 39 4 46 .11 4 0.4 1.0 35 MLO		
3 1434 32.56	19 14.06	155 32.76	8.10 1.8 1.4 38 5 71 .14 5 0.4 0.6 33 LSW		
3 2010 3.10	19 21.03	155 6.42	6.85 1.7 1.2 32 0 94 .11 5 0.4 0.9 24 SF4		
4 623 23.73	19 46.53	155 23.98	26.80 3.1 2.8 68 23 75 .12 6 0.3 0.6 46 KEA		
4 1611 14.16	19 18.56	155 13.53	6.91 2.1 2.0 39 3 84 .10 3 0.4 0.6 24 SF2		
4 1752 36.51	19 13.33	155 29.86	6.78 2.1 1.7 39 1 74 .16 3 0.4 0.9 17 LSW		
4 1835 2.17	19 18.66	155 13.21	6.12 1.6 1.1 24 1 85 .09 3 0.4 1.1 15 SF2		
5 830 42.61	19 25.73	155 13.85	2.91 2.1 1.3 34 13 116 .11 2 0.3 0.5 20 SER		
5 916 46.27	19 57.05	156 26.22	30.39 2.4 23 3 311 .09 86 2.0 5.9 18 DIS		
5 2247 45.59	19 18.31	155 16.62	9.68 2.4 2.4 53 7 135 .12 4 0.3 0.3 47 SFT		
6 948 14.89	19 23.93	155 15.70	2.72 1.7 1.0 30 10 72 .11 2 0.3 0.3 20 SEC		
6 10 2 41.41	19 17.31	155 13.66	6.33 1.4 1.2 34 7 92 .13 1 0.4 0.7 27 SF2		
6 1410 16.48	19 47.83	156 36.67	44.17 2.3 15 6 300 .13 80 2.4 3.4 9 DIS		
6 18 9 29.48	19 19.79	155 9.74	8.21 1.6 1.2 44 10 87 .10 4 0.3 0.4 34 SF3		
6 2022 38.74	19 20.98	155 2.46	5.49 0.9 1.3 40 7 151 .18 2 0.7 0.9 33 SF5		
7 346 11.62	19 27.88	155 40.62	14.15 1.4 18 4 133 .12 12 0.5 0.6 14 KCH		
7 16 8 45.83	19 20.75	155 10.70	7.88 1.7 1.2 39 6 74 .12 3 0.4 0.4 35 SF3		
7 1853 23.88	19 24.94	155 19.47	6.56 2.7 2.4 53 10 38 .12 2 0.3 0.5 43 KAO		
8 124 12.89	19 20.11	155 10.96	8.66 2.6 2.9 51 9 84 .11 4 0.4 0.3 47 SF3		
8 813 18.39	19 20.51	155 11.64	9.08 1.6 1.2 24 3 117 .06 4 0.5 0.7 18 SF3		
8 1548 21.09	19 17.92	155 27.55	8.77 1.7 1.3 40 5 46 .16 7 0.3 0.6 36 LSW		
9 926 37.17	19 25.23	155 19.61	5.72 2.5 1.7 31 7 70 .12 3 0.4 0.9 23 KAO		
9 1428 7.92	19 58.22	156 23.87	6.01 3.7 4.3 54 7 224 .13 66 1.0 1.3 45 DIS		

YEAR	MON	DA	HRON	ORIGIN TIME		LAT N		LON W		DEPTH MP DIR		GAP RMS MIN ERI		ERZ NO							
				SEC	DEG MIN	DEG MIN	DEG MIN	KM	MAG	MP	DIR	NS	DEG SEC		DIS	KM	KM	RM	RM	RM	
1988	MAY	18	2257	21.22	19	20.02	155	10.22	8.28	1.6	1.2	37	6	85	.12	4	0.4	0.5	32	SF3	
		19	036	50.56	19	14.20	155	20.54	29.28	2.4	2.4	65	13	156	.13	6	0.5	0.4	52	DEP	
		19	221	35.02	19	20.58	155	12.67	8.53	1.8	1.2	40	7	68	.12	4	0.4	0.3	35	SF2	
		19	1848	10.01	19	29.13	155	56.83	7.54	2.2	1.6	19	2	282	.19	3	1.7	0.8	9	KON	
		19	2348	32.41	19	23.06	155	14.81	3.17	1.9	1.1	31	10	63	.12	2	0.3	0.3	20	SBC	
		20	030	51.80	19	25.16	155	19.88	7.12	1.8	1.2	32	9	65	.12	3	0.3	0.6	24	KAO	
		20	1012	52.59	19	19.11	155	26.38	10.01	1.2	31	3	58	.12	6	0.4	0.5	29	KAO		
		20	19	4	17.54	19	26.67	155	50.43	8.62	2.4	2.2	39	5	111	.16	9	0.4	0.6	34	KON
		20	2246	33.39	19	18.33	155	15.01	7.53	1.2	1.2	14	0	129	.04	4	0.8	1.5	13	SF1	
		20	2249	50.07	19	29.95	155	53.51	9.72	2.5	1.8	39	6	127	.12	3	0.5	0.3	36	KON	
		21	0	16.87	19	53.80	156	23.21	2.28	1.8	37	3	284	.12	67	3.6	2.1	34	DIS		
		21	821	44.87	19	20.13	155	26.77	9.44	1.9	1.5	41	11	42	.13	6	0.3	0.6	30	KAO	
		21	1122	33.96	19	20.11	155	7.90	7.23	0.9	1.2	39	6	90	.12	5	0.4	0.5	35	SF4	
		21	1147	55.33	19	22.35	155	29.92	9.05	1.4	41	5	33	.11	4	0.3	0.5	36	KAO		
		21	2255	27.40	19	20.98	156	25.14	37.78	2.7	2.8	46	4	297	.11	55	1.1	1.8	42	DIS	
		22	1	8	42.53	19	52.98	156	21.94	0.70	1.5	25	2	306	.15	59	2.9	0.9	8	DIS	
		22	121	4.93	19	26.13	155	30.08	10.44	1.9	1.2	42	9	39	.11	8	0.3	0.5	33	KAO	
		22	720	14.37	19	26.71	155	29.93	8.90	2.6	2.6	49	10	42	.13	9	0.3	0.7	36	KAO	
		22	9	31.06	19	19.73	155	10.34	7.41	2.1	2.2	46	5	92	.14	4	0.4	0.7	33	SF3	
		22	939	10.38	19	21.03	155	7.64	7.27	1.6	1.3	33	3	81	.11	4	0.4	0.8	22	SF4	
		22	1043	47.22	19	22.25	155	30.26	6.66	2.8	3.0	49	6	32	.10	5	0.3	0.6	38	KAO	
		22	1242	20.65	19	20.79	155	2.41	9.43	1.7	1.7	35	5	152	.13	2	0.5	0.7	20	SF5	
		22	2154	34.02	19	20.50	155	7.56	8.66	2.1	1.9	54	12	90	.12	5	0.3	0.43	SF4		
		23	051	52.42	19	25.23	155	28.87	10.00	2.3	1.9	49	10	33	.11	6	0.3	0.4	40	KAO	
		23	249	19.67	19	45.64</															

YEAR	MON	DA	ORIGIN TIME		LAT N	LON W	DEPTH		AMP		DUR		GAP		RWS	MIN	RSH	E2Z NO		
			HRVN	SEC			KM	MIN	KM	MAG	NR	NS	DEG	SEC					DIS	KM
1988	MAY	26	452	30.29	19	25.51	155	16.29	7.51	1.9	1.5	14	4	123	.11	2	0.7	0.7	10 INT L	
		26	659	33.72	19	24.35	155	15.62	12.18	1.5	1.8	21	4	90	.13	2	0.9	0.6	17 INT L	
		26	910	14.95	19	25.29	155	16.49	8.91	2.1	1.9	19	3	160	.13	1	1.1	0.9	2 INT L	
		26	1131	3.62	19	24.40	155	16.29	7.32	2.0	2.0	19	1	87	.13	1	0.7	0.9	0 INT L	
		26	1149	6.41	19	20.23	155	15.79	6.31	2.1	1.9	4	1	328	.01	10	3.8	8.8	0 GUN L	
		26	1312	3.00	19	20.53	155	11.70	8.67	2.1	2.0	52	13	75	.11	4	0.3	0.3	40 SF3	
		26	1326	45.64	19	21.95	155	1.24	8.69	1.8	1.6	37	5	182	.15	5	0.7	0.4	33 SF5	
		26	15	8	48.66	19	19.71	155	11.67	7.43	1.9	1.7	45	10	90	.14	5	0.4	0.5	36 SF3
		26	1740	22.36	19	22.83	155	2.62	8.08	2.0	1.7	51	10	120	.18	4	0.5	0.4	41 SF5	
		27	214	26.65	19	12.63	155	30.35	5.40	1.8	1.3	35	3	76	.16	5	0.4	1.1	29 LSW	
		27	1225	20.61	19	19.19	155	13.44	7.21	1.6	1.2	24	7	75	.09	4	0.4	0.7	20 SF2	
		27	1516	7.10	19	22.37	155	4.56	8.49	2.3	2.3	48	9	79	.09	4	0.5	0.3	36 SF5	
		27	1633	22.46	19	28.92	155	26.54	6.79	3.2	2.8	61	15	75	.14	6	0.3	0.6	46 KAO	
		27	1645	8.93	19	19.40	155	9.81	8.38	2.1	2.1	40	8	97	.10	5	0.4	0.5	33 SF3	
		27	1738	48.95	19	14.25	155	27.84	6.13	1.7	1.2	23	3	94	.14	4	0.4	1.0	18 LSW	
		27	1921	19.04	19	56.75	155	17.52	15.35	2.1	1.7	23	5	247	.06	8	1.2	0.4	19 KKA	
		28	932	6.07	19	50.89	156	17.70	6.23	3.4	4.2	28	0	302	.13	51	6.0	2.4	15 HUA	
		28	933	58.44	19	19.78	155	10.95	9.68	1.6	1.2	11	0	106	.05	5	0.9	2.1	11 SF3	
		28	13	0	44.41	19	18.00	155	14.23	4.65	1.6	1.1	19	0	106	.08	2	0.5	1.3	13 SSF
		28	1959	34.17	19	53.00	155	35.06	7.68	2.1	1.4	12	0	196	.09	8	1.0	1.7	10 KKA	
		28	2036	34.22	19	10.77	155	41.39	2.77	2.4	2.3	42	7	124	.20	11	0.5	1.2	35 LSW	
		28	2311	7.29	19	24.67	155	29.36	9.09	2.0	1.2	31	4	39	.10	5	0.4	0.8	26 KAO	
		28	2324	28.49	19	28.50	155	27.53	8.74	2.8	2.7	53	10	57	.13	6	0.3	0.6	42 KAO	
		28	2326	48.35	19	19.21	155	13.68	7.31	1.8	1.5	26	2	70	.10	4	0.5	0.9	23 SF2	
		29	236	15.88	19	26.78	155	30.03	9.50	2.2	1.4	37	5	112	.6	0.3	0.8	30 KAO		
		29	6	7	0.95	19	20.73	155	3.67	4.67	1.9	1.7	36	5	92	.16	2	0.5	1.3	32 SSF
		29	7	3	2.86	19	20.84	155	6.21	8.18	2.1	1.9	39	8	100	.10	5	0.4	0.5	31 SF4
		29	1320	59.27	19	22.46	155	13.09	3.21	4.4	1.1	6	1	172	.04	0	1.1	0.6	5 SSR	
		29	1735	9.28	19	10.71	155	35.62	7.65	2.2	1.8	31	0	100	.16	8	0.5	1.4	23 LSW	
		29	2221	37.33	19	53.53	156	10.03	9.04	2.5	2.2	18	0	310	.10	41	7.4	2.2	15 HUA	
		29	2246	50.99	19	56.61	156	27.40	7.94	3.3	3.5	30	2	310	.10	76	5.8	8.3	25 DIS	
		30	944	56.86	19	28.22	155	26.00	0.74	2.3	1.6	19	2	103	.11	6	0.4	0.5	13 KAO	
		30	21	8	22.99	19	15.41	155	13.75	6.73	1.0	1.2	13	1	270	.14	10	1.3	2.7	11 SF2
		30	2341	8.82	19	20.10	155	12.63	7.18	2.8	3.1	51	4	74	.15	5	0.4	0.6	40 SF2	
		30	2345	54.05	19	19.70	155	12.66	6.25	0.9	1.5	28	1	80	.11	5	0.4	1.0	19 SF2	
		31	556	19.85	19	20.14	155	6.62	9.33	3.6	3.9	57	10	112	.10	6	0.4	0.3	49 SF4	
		31	622	35.75	19	45.66	154	55.48	42.64	2.3	1.8	30	3	238	.11	18	1.2	1.1	22 HIL	
		31	837	34.80	19	19.60	155	6.63	6.72	2.0	1.9	22	2	124	.06	5	0.4	1.2	17 SF4	
		31	10	6	40.25	19	18.22	155	7.10	3.79	1.7	1.1	19	0	157	.09	2	0.9	1.0	11 SSF
		31	1124	46.79	19	17.96	155	6.77	4.10	1.7	1.2	18	0	181	.09	2	0.9	1.0	12 SSF	
		31	1619	51.92	19	24.03	155	12.04	58.59	2.2	2.8	35	7	83	.19	3	2.0	1.0	28 DEP	
		31	2016	35.84	19	19.61	155	11.33	8.59	1.6	1.2	41	6	93	.12	5	0.4	0.4	35 SF3	
JUN		1	611	8.41	19	18.21	155	6.91	3.69	1.7	1.1	14	0	164	.08	2	0.9	1.1	7 SSF	
		1	754	4.32	19	18.42	155	7.23	9.71	3.1	3.4	48	4	176	.13	8	0.7	0.5	40 SF4	
		1	858	11.36	19	17.66	155	6.63	3.08	1.7	1.2	19	0	199	.09	2	1.1	0.6	13 SSF	

YEAR	MON	DA	HR	MIN	SEC	ORIGIN TIME	LAT N	LONG W	DEPTH	AMP	DIR	KM	MAG	MAG NR	NS	DEG	SEC	DIS	KM	RMS MIN	ERH	ERZ NO	
1988	JUN	20	731	59.91	19	31.86	155 12.74	13.99	2.9	2.6	65	20	50	12	10	0.3	0.3	0.4	44	DEP F			
		20	1550	25.41	19	19.01	155 29.05	9.86	3.8	4.0	55	7	39	11	7	0.3	0.4	48	LSW F				
		21	1113	12.21	19	21.35	155 2.20	5.10	1.5	1.7	29	5	155	13	3	0.4	1.0	21	SF5				
		21	1312	3.49	19	14.35	155 35.01	8.09	1.9	2.4	47	7	79	17	4	0.4	0.7	38	LSW				
		22	017	52.54	20	7.58	156 0.59	12.26	2.2	3.1	30	0	277	13	24	6.8	2.3	33	KOH				
		22	2	5	39.97	19	20.51	155 7.53	8.49	2.2	2.4	49	6	90	11	5	0.5	0.4	44	SF4			
		22	717	46.94	19	17.78	155 12.96	8.61	1.2	1.6	39	5	118	12	2	0.4	0.5	37	SF2				
		22	811	40.85	19	27.39	154 53.39	6.64	2.1	2.1	43	6	142	15	3	0.7	0.4	38	LSR				
		22	826	24.21	19	48.51	156 8.95	7.91	2.9	3.3	37	4	262	14	35	1.1	1.0	34	HUA				
		22	919	24.61	19	17.88	155 13.01	8.86	2.1	1.9	38	5	144	11	9	0.4	0.6	34	SF2				
		22	1745	38.41	19	18.53	155 15.21	9.24	2.4	2.7	52	7	134	12	5	0.3	0.4	35	SF1				
		22	1919	14.63	19	21.66	155 30.05	9.95	2.0	1.7	38	2	44	09	5	0.3	0.5	19	KAO				
		22	2137	9.10	19	26.88	155 46.72	11.67	2.3	1.5	22	2	84	13	7	0.7	0.8	9	KON				
		22	2148	36.29	19	24.26	155 16.37	15.78	3.2	3.9	64	14	32	12	1	0.4	0.3	48	DEP F				
		23	121	48.61	19	11.58	155 26.96	7.03	2.1	1.9	44	5	131	14	4	0.4	0.7	40	LSW				
		23	236	13.75	19	20.48	155 7.23	8.37	2.0	2.0	45	4	95	12	5	0.5	0.4	44	SF4				
		23	845	31.88	19	26.03	155 20.18	5.92	2.8	2.0	41	12	39	13	3	0.3	0.6	30	KAO				
		23	1428	4.70	19	21.94	155 26.79	10.26	1.6	1.6	30	4	44	08	2	0.3	0.5	25	KAO				
		23	1459	31.78	19	44.73	155 1.83	0.00	2.6	2.8	30	0	239	28	7	3.8	3.0	12	HIL B				
		23	1810	24.89	19	18.84	155 28.22	10.85	1.7	1.4	22	2	68	11	7	0.5	0.9	13	LSW				
		23	1926	39.02	19	19.52	155 16.38	31.48	2.2	2.3	48	5	96	12	2	0.6	0.8	40	DEP				
		23	1952	6.06	19	24.21	155 15.87	3.38	1.8	1.3	15	1	84	07	1	0.4	0.4	11	SEC				
		23	2130	34.47	19	18.50	155 11.77	8.20	1.9	2.0	50	9	87	12	5	0.4	0.4	41	SF3				
		24	1440	40.16	19	16.34	155 29.84	7.79	2.3	2.3	51	6	54	19	2	0.4	0.8	45	LSW				
		24	1712	58.26	19	22.92	155 30.41	9.77	2.1	1.6	43	5	13	09	5	0.3	0.5	41	KAO				
		25	9	2	4.78	19	20.32	155 6.75	8.13	1.9	1.2	48	7	105	12	6	0.3	0.4	43	SF4			
		25	9	27.58	19	17.76	155 12.66	10.51	1.3	1.1	33	7	131	12	2	0.6	0.5	28	SF2				
		25	911	18.49	19	23.76	155 13.68	30.88	1.3	46	8	84	10	2	0.8	0.5	38	DEP					
		25	1258	56.69	19	23.37	155 27.41	11.07	2.2	2.2	55	11	31	15	2	0.4	0.4	44	KAO				
		25	1531	7.32	19	18.19	155 13.18	9.22	2.2	2.1	60	14	95	13	2	0.3	0.3	49	SF2				
		25	22	3	49.74	19	23.79	155 26.73	9.99	2.3	1.9	58	12	29	12	3	0.3	0.4	45	KAO			
		25	2227	0.10	20	6.20	156 36.24	50.10	2.4	24	2	324	15	92	2.5	2.8	23	DIS					
		26	155	20.45	19	42.02	156 11.85	12.81	1.8	37	5	287	17	38	1.0	0.7	33	HUA					
		26	229	4.81	19	48.09	156 9.80	12.91	1.6	2.0	28	5	291	18	36	1.3	1.0	23	HUA				
		26	247	10.51	18	57.07	155 22.63	39.93	3.0	3.1	58	10	233	13	25	0.9	0.6	50	LOI				
		26	18	9	41.71	19	19.90	155 11.64	5.86	1.7	1.7	22	2	86	09	5	0.4	1.0	17	SF3			
		26	1838	11.63	19	11.90	155 28.94	34.11	2.4	2.4	41	4	83	07	5	0.6	1.1	37	DLS				
		27	253	21.99	19	22.30	155 3.78	6.69	1.7	1.4	32	5	102	12	4	0.4	0.6	30	SF5				
		27	743	3.57	19	19.97	155 6.41	8.56	1.7	1.4	41	7	119	11	6	0.4	0.4	34	SF4				
		27	1055	2.51	19	16.08	155 16.00	29.51	2.9	3.7	71	20	153	13	5	0.5	0.4	50	DEP				
		27	1141	17.73	19	21.16	155 30.56	9.25	2.3	2.4	39	4	49	11	6	0.3	0.6	34	KAO				
		28	155	42.46	19	24.47	155 16.80	15.06	2.9	3.6	63	17	29	12	1	0.4	0.2	45	DEP				
		28	547	24.18	19	12.42	155 19.91	41.36	2.0	2.0	50	6	169	11	8	0.9	0.6	46	DEP				
		28	1139	13.72	19	56.81	155 16.49	11.13	2.9	3.1	45	4	205	11	37	0.6	0.7	41	KFA				
		28	1219	50.72	19	21.48	155 7.88	8.84	2.1	2.6	41	4	73	10	3	0.4	0.4	37	SF4				

YEAR	MON	DA	HR	MIN	SEC	ORIGIN TIME	LAT N	LONG W	DEPTH	AMP	DIR	KM	MAG	MAG NR	NS	DEG	SEC	DIS	KM	RMS	MIN	ERH	ERZ NO
1988	JUN	28	1314	39.88	19	17.48	155 13.02	8.05	2.3	2.5	45	8	132	12	1	0.4	0.6	35	SF2				
		28	1328	38.64	19	17.34	155 12.94	7.21	2.0	2.0	34	7	149	12	1	0.5	0.8	26	SF2				
		28	1718	53.75	19	23.41	155 21.45	11.10	1.9	1.6	30	3	56	08	3	0.4	0.9	22	KAO				
		28	18	32.35	19	19.86	155 12.29	7.91	2.0	2.0	40	3	81	12	5	0.4	0.6	25	SF3				
		28	1833	1.19	19	17.84	155 21.86	6.41	1.3	25	2	116	08	5	0.4	1.1	13	SAR					
		28	1913	6.06	19	58.29	156 23.33	7.02	1.8	13	1	339	09	83	8.7	11.3	5	DLS	-				
		28	1930	55.83	19	22.19	155 2.47	6.86	1.1	1.7	25	1	139	11	4	0.5	1.0	14	SF5				
		28	23	6	49.87	19	20.78	155 13.25	9.32	1.2	36	8	60	12	3	0.4	0.4	30	SF2				
		29	1029	39.24	19	16.22	155 27.64	7.45	1.7	1.4	27	5	64	14	5	0.4	1.0	23	LSW				
		29	1136	7.33	19	16.48	155 22.11	2.17	1.9	1.5	27	6	132	10	5	0.3	0.7	23	SAR				
		29	1146	30.65	19	21.41	155 30.74	8.58	2.3	2.3	40	4	37	11	6	0.3	0.6	38	KAO				
		29	1238	56.96	19	22.26	155 26.77	10.25	2.1	1.7	32	3	39	11	2	0.4	0.6	29	KAO				
		29	13	4	10.33	19	12.62	155 21.98	3.64	1.7	1.3	18	2	180	11	5	0.9	1.5	17	SAR	*		
		29	1438	3.26	19	16.08	155 23.07	4.81	1.1	19	5	124	10	4	0.4	1.8	14	SAR					
		29	1716	45.76	19	19.12	155 9.66	5.89	1.6	1.5	27	2	103	11	4	0.4	1.3	18	SF3				
		29	1955	5.45	19	19.08	155 13.85	8.59	1.6	1.6	21	1	87	05	4	0.5	1.1	14	SF2				
		30	911	45.62	19	20.40	155 10.95	8.48	1.6	1.4	44	11	79	13	4	0.4	0.4	33	SF3				
		30	18	0	0.37	19	36.94	155 4.98	8.46	2.3	1.3	29	3	121	10	11	0.4	1.8	13	HIL			
JUL	1	5	1	35.54	19	19.37	155 16.44	8.36	2.1	1.9	53	10	98	13	2	0.3	0.3	44	SF1				
		1	1258	35.30	19	10.68	155 33.36	6.99	2.3	2.3	46	7	106	17	10	0.4	1.0	40	LSW				
		1	2134	36.29	19	17.38	155 21.39	8.81	1.3	36	5	126	15	5	0.4	0.6	32	SAR					
		2	338	12.03	19	15.89	155 31.03	7.63	1.8	1.4	48	6	54	20	2	0.4	0.9	42	LSW				
		2	516	41.27	19	21.49	155 4.67	8.99	1.1	1.4	50	9	84	13	4	0.4	0.3	43	SF5				
		2	842	30.79	19	20.04	155 11.23	8.94	0.9	1.2	46	8	85	13	4	0.4	0.4	38	SF3				
		2	934	23.40	19	24.23	155 16.08	3.75	1.6	0.9	20	83	13	1	0.3	0.4	14	SFC					
		2	1816	2.65	19	19.74	155 11.65	8.50	2.2	2.0	52	10	89	14	5	0.3	0.3	44	SF3				
		2	1927	17.17	19	19.92	155 8.22	8.63	0.9	1.2	43	8	84	11	5	0.4	0.4	35	SF4				
		2	20	7	50.96	19	13.11	155 26.38	7.49	1.3	27	1	126	13	5	0.5	1.1	10	LSW				
		3	124	36.49	19	19.66	155 9.08	8.04	2.2	1.9	52	11	83	12	5	0.3	0.3	43	SF4				
		3	4	4	57.67	19	29.02	155 26.11	2.22	1.6	1.3	28	8	94	15	5	0.3	0.6	19	KAO			
		3	524	47.49	19	35.72	156 2.53	43.30	2.0	36	3	231	10	18	1.3	0.6	34	KON					
		3	659	14.09	19	24.81	155 19.41	5.17	1.9	1.1	33	12	63	16	2	0.3	0.6	22	KAO				
		3	1639	6.95	19	16.86	155 30.16	9.59	1.2	1.5	27	4	50	13	3	0.4	0.6	24	LSW				
		3	2033	17.87	19	19.23	155 52.80	10.81	1.4	23	1	177	15	6	0.7	0.5	22	KON					
		3	2135	54.40	19	12.40	155 26.08	8.09	1.2	16	0	165	08	5	0.9	1.5	8	LSW					
		3	1710	36.25	19	8.38	155 18.93	40.88	1.3	1.7	43	7	196	13	14	1.2	0.7	36	LOT				
		3	1848	50.75	19	28.07	155 50.62	9.28	1.7	29	5	133	16	8	0.5	0.6	24	KON					
		3	1938	9.31	19	12.92	155 27.36	9.60	5.4	4.9	47	0	115	14	6	0.6	0.5	52	LSW	F			
		3	1957	1.01	19	13.48	155 27.98	1.11	1.1	25	1	101	14	7	0.4	0.9	24	LSW					
		3	2033	17.87	19	19.23	155 52.80	10.81	1.4	23	1	177	15	6	0.7	0.5	22	KON					
		3	2135	54.40	19	12.40	155 26.08	8.09	1.2	16	0	165	08	5	0.9	1.5	8	LSW					
		3	2231	53.66	19	12.56	155 27.88	9.74	1.7	34	3	104	13	6	0.5	0.5	32	LSW					
		3	23	7	46.89	19	11.48	155 27.04	10.36	1.3	34	4	131	18	4	0.5	0.5	30	LSW				
		4	1	3	36.29	19	19.13	155 13.67	9.50	2.3	2.6	56	9	66	13	4	0.3	0.3	49	SF2			
		4	11	1	17.96	19	20.48	155 8.17	8.38	1.6	1.4	39	6	80	13	4	0.5	0.4	33	SF4			
		4	1828	40.70	19	24.08	155 15.88	3.22	2.4	2.3	30	5	72	11	1	0.3	0.3	16	SFC				
		4	2133	40.68	19	26.57	155 22.04	10.37	2.2	1.6	45	10	48	13	3	0.4	0.4	35	KAO				

YEAR	MON	DA	ORIGIN TIME		LAT N	LON W	DEPTH AMP DUR			GAP RMS MIN ERH			ERZ NO								
			HRVN	SEC			KM	MAG	NR	NS	DES	DIS		KM	RM	RM					
1988	JUL	4	2158	57.02	19	16.27	155	22.88	6.17	2.1	2.2	50	5	124	.18	4	0.4	0.8	45	SAR	
		5	912	55.25	19	12.16	155	28.02	6.76	2.1	2.0	26	2	104	.14	5	0.5	1.0	14	LSW	
		5	913	48.38	19	11.71	155	27.97	6.48	1.8	1.6	18	1	104	.13	4	0.5	1.5	10	LSW	
		6	126	43.67	19	11.51	155	26.60	9.29	2.4	2.3	46	3	140	.14	4	0.4	0.4	43	LSW	
		6	334	19.24	19	25.28	155	20.33	6.62	2.3	2.0	45	10	38	.14	3	0.3	0.6	35	KAO	
		6	350	57.02	19	22.22	155	30.08	9.90	1.7	1.4	41	5	42	.11	4	0.3	0.5	37	KAO	
		6	744	3.12	19	20.45	155	8.31	8.97	1.4	3.9	9	77	.14	4	0.4	0.4	32	SF4		
		6	1539	48.50	19	19.94	155	8.71	7.55	2.0	1.9	27	5	74	.09	4	0.4	0.9	13	SF4	
		6	19	9	45.16	19	14.98	155	15.57	31.47	1.9	1.5	19	0	195	.10	5	1.6	2.7	16	DEP
		6	2222	12.98	19	13.37	155	26.88	7.83	2.4	2.5	53	7	117	.14	5	0.3	0.5	46	LSW	
		7	4	32.01	19	26.68	155	28.63	9.62	1.7	1.2	51	10	43	.13	7	0.3	0.5	41	KAO	
		7	1038	23.02	19	20.81	155	6.08	7.08	2.1	2.1	44	5	102	.12	5	0.4	0.6	29	SF4	
		7	1439	6.64	19	19.13	155	15.44	7.51	1.5	1.2	17	1	106	.08	4	0.6	1.4	14	SF1	
		7	1525	33.13	19	57.35	155	26.59	7.00	2.7	1.7	19	2	315	.06	83	7.5	10.0	4	DIS	
		7	1545	56.55	19	11.89	155	27.61	7.01	2.1	1.9	29	1	113	.16	4	0.5	1.2	13	LSW	
		7	1554	2.78	19	38.83	155	3.86	0.93	2.4	2.5	18	1	172	.19	16	0.9	2.4	7	HIL B	
7	1723	43.34	19	12.53	155	27.23	7.58	2.4	2.6	35	1	117	.15	6	0.4	0.9	22	LSW			
7	23	6	26.69	19	18.51	155	13.58	9.00	2.2	2.4	56	6	73	.12	3	0.4	0.4	51	SF2		
7	23	8	37.81	19	18.39	155	13.50	8.71	2.1	2.0	48	6	77	.12	3	0.4	0.3	45	SF2		
9	048	55.85	19	20.02	155	8.77	7.42	1.6	1.5	36	5	73	.10	4	0.5	0.7	30	SF4			
9	739	18.50	19	29.12	155	26.68	6.90	2.6	1.9	46	14	79	.12	6	0.3	0.8	32	KAO			
9	1452	9.83	19	11.78	155	34.66	8.59	1.2	2.1	3	3	176	.15	7	0.7	1.0	13	LSW			
9	1927	4.11	19	28.72	155	28.11	2.14	2.0	1.3	30	7	63	.12	6	0.3	0.7	13	KAO			
9	21	4	22.58	19	23.66	155	16.89	2.90	2.7	2.6	31	5	46	.10	1	0.3	0.2	18	SSC		
9	2247	11.10	19	11.95	155	27.50	6.44	2.1	1.9	34	2	116	.16	5	0.5	1.3	21	LSW			
9	2321	29.54	19	24.21	155	15.93	3.30	2.1	1.9	21	2	73	.09	1	0.3	0.4	12	SEC			
9	2359	13.57	19	19.27	155	13.60	7.87	1.9	1.8	39	2	68	.12	4	0.4	0.7	27	SF2			
10	022	38.91	19	13.36	155	27.60	6.51	1.7	1.2	12	2	120	.19	5	0.6	2.0	6	LSW			
10	236	10.12	19	12.55	155	16.37	51.97	2.1	2.7	22	5	244	.11	10	1.9	0.9	17	DEP L			
10	1558	16.29	19	12.53	155	31.10	5.63	1.8	1.7	31	5	78	.19	5	0.6	1.6	24	LSW			
10	1912	55.89	20	41.89	155	28.14	16.31	4.0	4.7	56	6	306	.18	71	3.1	17.4	50	DIS			
10	1957	10.56	20	30.68	155	13.96	0.58	1.9	25	5	290	.21	70	6.9	2.1	20	DIS				
11	31	53.44	19	20.16	155	8.27	9.41	2.3	2.6	57	9	81	.13	4	0.5	0.3	51	SF4			
11	10	7	51.69	19	25.91	155	29.24	10.40	2.0	1.4	24	1	68	.08	7	0.4	1.0	21	KAO		
11	1231	24.75	19	40.58	155	9.27	39.52	2.3	1.9	52	10	93	.12	8	0.6	0.8	45	KKA			
11	1326	34.90	19	28.24	155	27.81	2.23	2.4	1.7	29	7	72	.11	7	0.3	0.6	17	KAO			
11	1652	10.42	19	25.22	155	19.81	3.86	1.9	1.3	21	4	68	.11	3	0.4	0.8	14	KAO			
11	17	2	50.19	20	20.16	155	7.68	7.95	1.8	1.6	25	2	93	.09	5	0.4	0.7	12	SF4		
11	1743	30.45	19	25.56	155	18.98	5.96	2.5	2.1	40	12	85	.14	2	0.3	0.5	29	INT			
11	1810	50.92	19	25.53	155	19.40	4.99	2.0	1.1	32	10	78	.13	3	0.3	0.6	23	KAO			
11	1811	14.26	19	25.42	155	18.95	6.00	2.2	1.5	31	10	83	.14	2	0.4	0.5	22	INT			
11	1817	47.54	19	25.05	155	19.63	4.54	2.6	3.4	57	12	37	.14	3	0.3	0.5	47	KAO			
11	1818	19.31	19	24.00	155	21.13	8.22	2.4	3.0	23	6	52	.24	3	0.7	1.2	17	KAO			
11	1833	2.78	19	18.46	155	15.45	7.78	1.9	1.5	39	4	103	.11	4	0.4	0.5	35	SF1			
11	1840	47.26	19	25.65	155	19.10	4.82	2.1	2.3	46	13	48	.17	3	0.3	0.5	32	KAO			

YEAR	MON	DAY	ORIGIN TIME		LAT N	LON W	DEPTH AMP DUR		CAP RMS MIN ERH		ERZ NO							
			HRAN	SEC			KM	MAG	NS	DEG		SEC	DIS	KM	RM	PM	REMK	
1988	JUL	11	1852	9.01	19 24.80	155 19.56	5.42	2.2	1.5	26	8	107	.08	2	0.3	0.6	18	KAO
		11	1917	47.09	19 25.44	155 19.24	4.53	2.7	3.4	58	12	38	.14	3	0.3	0.5	45	KAO
		11	1919	31.55	19 25.56	155 19.43	3.82	2.3	1.5	17	5	79	.12	3	0.4	0.7	11	KAO
		11	1922	11.90	19 25.43	155 18.68	6.24	2.3	1.8	30	10	80	.14	2	0.4	0.6	19	INT
		11	1927	15.63	19 25.54	155 19.69	3.51	1.9	1.1	22	5	75	.11	3	0.3	0.6	16	KAO
		11	1955	53.90	19 24.96	155 19.59	3.49	2.1	2.5	22	2	53	.10	4	0.4	0.9	20	KAO
		11	1959	36.69	19 17.19	155 12.16	7.68	0.9	1.4	32	4	164	.13	2	0.5	0.9	29	SF3
		11	2021	48.88	19 25.78	155 19.72	2.70	1.7	1.1	22	5	81	.12	4	0.3	0.5	17	KAO
		11	2023	47.26	19 24.91	155 19.51	4.51	2.1	2.5	43	10	44	.15	2	0.3	0.5	33	KAO
		11	2026	11.49	19 24.59	155 18.59	7.32	2.1	1.2	17	8	152	.10	2	0.6	0.7	8	INT
		11	2031	42.70	19 25.41	155 18.89	6.03	2.2	1.5	31	9	78	.15	2	0.4	0.5	21	INT
		11	2049	5.23	19 17.39	155 29.15	12.22	2.4	2.2	50	7	49	.14	5	0.3	0.4	13	LSW
		11	2125	20.98	19 25.93	155 19.80	3.38	1.8	1.3	25	5	84	.14	3	0.3	0.6	15	KAO
		11	2128	31.25	19 19.44	155 12.09	8.01	1.6	1.4	31	5	91	.12	5	0.4	0.8	27	SF3
		11	2128	56.47	19 25.30	155 19.70	5.21	2.1	1.7	28	8	70	.13	3	0.3	0.7	19	KAO
		11	2133	18.37	19 25.48	155 19.17	5.34	1.8	1.4	27	5	79	.14	3	0.5	0.8	22	KAO
		11	2140	23.68	19 25.55	155 19.51	5.27	2.0	1.3	28	7	78	.13	3	0.4	0.6	21	KAO
		11	2158	54.92	19 20.49	155 8.87	8.87	1.2	1.7	2	74	.07	3	0.7	0.8	15	SF4	
		11	2223	3.71	19 17.58	155 29.24	11.41	2.0		22	3	78	.11	10	0.4	0.8	19	LSW
		11	2236	33.24	19 25.31	155 19.74	3.89	1.9	1.1	21	4	70	.11	3	0.4	0.7	16	KAO
12	119	20.76	19 25.43	155 20.17	2.87	1.7	9	3	102	.11	3	0.4	0.9	6	KAO			
12	537	38.06	19 16.25	155 26.55	9.08	1.7	1.7	26	3	63	.12	6	0.4	0.7	20	LSW		
12	841	51.31	19 21.07	155 2.12	3.28	2.2	3.2	9	0	168	.10	3	1.0	1.5	3	SF5		
12	931	44.86	19 25.23	155 19.60	3.78	2.3	2.4	32	6	59	.11	3	0.3	0.5	23	KAO		
12	944	53.38	19 25.21	155 19.52	4.62	2.0	1.3	26	5	70	.12	3	0.4	0.8	19	KAO		
12	1429	34.50	19 25.17	155 19.89	4.56	2.3	1.5	20	5	100	.08	3	0.4	0.9	13	KAO		
12	1642	35.62	18	1.50	155 4.21	7.00		42	0	324	.14133	13.0	17.2	42	DIS	T		
13	147	49.74	19 19.36	155 48.06	8.95	2.0	1.5	31	4	97	.13	10	0.4	0.8	28	KCN		
13	243	42.06	19 13.14	155 27.04	7.11	1.7	1.3	33	4	120	.14	6	0.4	0.8	29	LSW		
13	1228	24.88	19 20.15	155 5.92	7.98	2.0	2.1	32	3	120	.10	5	0.5	0.7	16	SF4		
14	022	24.14	19 27.00	155 20.90	7.19	2.0	1.2	28	7	61	.13	1	0.4	0.6	21	KAO		
14	11	9	8.36	19 17.31	155 15.17	8.25	1.7	1.9	22	0	164	.10	3	0.6	0.7	17	SF1	
15	857	46.08	19 18.45	155 29.17	12.37	1.3	30	2	50	.08	6	0.4	0.7	28	LSW			
15	11	6	20.53	19 20.09	155 12.52	8.43	2.7	3.1	53	9	75	.13	5	0.4	0.5	48	SF2	
16	220	23.61	19 20.99	155 2.88	8.27	2.2	2.3	49	7	135	.11	2	0.5	0.4	44	SF5		
16	245	45.55	19 23.79	155 15.45	2.72	1.5	0.7	26	10	100	.10	2	0.2	0.3	17	SEC		
16	355	29.72	19 19.61	155 8.25	8.79	2.0	1.1	48	7	86	.12	4	0.3	0.4	43	SF4		
16	2056	15.20	19 11.89	155 28.49	0.37	1.8	1.3	35	6	115	.14	5	0.4	0.3	31	LSW		
16	2234	56.89	19 19.20	155 13.94	7.95	0.9	1.2	42	5	75	.11	4	0.3	0.6	37	SF2		
16	2328	31.39	19 37.14	156 0.65	14.65	1.8	1.9	22	3	224	.13	17	1.0	0.4	20	KCN		
16	2358	3.17	19 8.50	155 40.73	1.07	1.6	28	3	130	.18	13	0.4	0.6	25	LSW			
17	817	8.19	19 27.49	155 28.22	11.34	1.7	1.2	38	6	52	.13	7	0.4	0.5	32	KAO		
17	930	51.32	19 21.56	155 2.22	7.33	2.0	2.1	32	3	142	.13	3	0.5	0.7	13	SF5		
17	953	42.15	19 23.83	155 30.05	10.02	2.0	1.9	44	5	33	.10	5	0.3	0.4	41	KAO		
17	1725	47.50	19 15.48	155 16.16	31.35	4.3	4.5	54	3	158	.11	5	0.6	0.9	51	DEP	P	

YEAR	MON	DA	ORIGIN TIME		LAT N	LON W	DEPTH		AMP		DUR	GAP		RMS	MIN	EXH	E22 NO					
			HR	SEC			KM	MIN	KM	MAG		NR	DEG					SEC	DIS	KM	RM	RM
1988	JUL	17	1846	20.57	19	20.13	155	11.57	8.28	1.6	1.8	30	2	82	.09	5	0.4	0.7	23	SF3		
		17	2237	9.34	19	15.71	155	15.93	31.94	1.9	1.7	42	0	157	.10	5	0.7	1.4	42	DEP		
		18	111	2.34	19	21.83	155	12.68	3.02	1.3	1.7	3	105	.08	2	0.5	0.3	15	SER			
		18	325	9.47	19	19.80	155	11.77	8.02	1.7	1.7	47	8	86	.12	5	0.3	0.4	41	SF3		
		18	18	4.45	08	19	11.36	155	28.23	7.77	2.4	2.4	38	3	113	.16	4	0.4	0.7	22	LSW	
		18	22	7	57	28	20	39.31	9.18	1.6	2.5	34	4	307	.12	70	6.2	8.7	31	DIS		
		19	0	2	10	97	19	22.97	155	26.98	10.10	1.6	1.4	42	4	34	.12	1	0.3	0.4	39	KAO
		19	1112	21.72	19	19.45	155	13.66	8.94	2.8	3.2	56	7	64	.12	5	0.4	0.5	43	SF2		
		19	18	6	26	67	19	29.33	7.14	2.1	1.3	21	2	95	.19	6	0.7	1.1	10	KON		
		20	143	23.91	19	15.59	155	16.04	29.54	1.9	1.5	41	9	157	.12	5	0.8	0.6	32	DEP		
		20	333	40.08	19	12.34	155	27.48	5.85	2.1	1.9	43	4	114	.16	5	0.4	0.9	39	LSW		
		20	337	9.21	19	19.92	155	11.85	9.65	1.6	1.7	43	7	84	.13	5	0.4	0.4	39	SF3		
		20	534	38.91	19	22.02	155	29.78	9.66	1.7	1.2	38	5	99	.12	4	0.3	0.5	35	KAO		
		20	1018	50.24	19	11.88	155	41.35	4.09	2.2	1.9	40	5	118	.20	9	0.6	3.5	35	LSW		
		20	1348	16.70	19	26.53	154	56.21	6.72	1.1	1.3	29	3	161	.15	2	1.0	0.4	26	LER		
		20	2340	16.77	19	55.54	156	45.76	43.42	2.4	2.1	2	325	.17	100	3.3	4.4	21	DIS			
		21	0	2	9	87	18	31.51	156	17.91	29.21	2.0	2.2	4	328	.11	84	1.4	5.0	20	DIS	
		21	721	29.15	19	18.07	155	20.72	30.96	2.2	1.8	45	4	121	.12	4	0.7	0.7	41	DEP		
		21	1111	27.47	19	13.87	155	27.13	6.35	1.7	1.7	36	4	109	.15	6	0.4	0.9	33	LSW		
		21	1728	2.50	19	11.01	155	41.47	4.01	2.0	1.2	16	0	123	.14	11	0.8	14.0	11	LSW		
		21	1741	13.72	18	57.83	155	7.99	16.98	2.0	2.1	44	7	245	.14	36	0.9	15.4	37	LOI		
		22	353	6.67	17	23.33	154	59.76	7.30	3.8	3.9	60	11	334	.12	91	1.1	9.9	49	DIS		
		22	722	41.69	19	55.88	155	10.74	40.76	2.7	3.1	68	20	213	.13	18	0.5	0.7	49	KEA		
		22	8	9	55	29	19	19.44	8.34	1.9	2.1	50	10	80	.14	5	0.4					

YEAR	MON	DA	ORIGIN TIME		LAT N	LON W	DEPTH ANP DUR		GAP RMS MIN ERH		ERZ NO										
			HRN	SEC			KM	MAG	NK	NS		DEG	SEC	DIS	KM	KM	FM	REAR			
1988	JUL	28	455	48.41	19	20.51	155	12.68	8.68	1.9	2.0	48	6	140	.13	4	0.6	0.4	43	SF2	
		28	7	8	2.85	19	17.62	155	13.08	8.19	2.2	2.1	49	10	119	.13	1	0.3	0.4	40	SF2
		28	1131	3.71	19	25.06	155	16.84	2.18	2.0	1.9	14	1	96	.13	0	0.5	0.3	1	SC	
		28	2050	30.59	19	48.69	156	41.77	35.67	2.0	1.7	2	330	.13103	3.4	4.8	6	DIS			
		28	2152	40.59	19	57.57	155	21.61	12.34	2.1	1.7	22	2	214	.10	8	1.0	0.4	20	KEA	
		29	215	13.81	19	20.27	155	5.83	7.88	2.4	2.7	58	11	140	.13	5	0.3	0.3	49	SF4	
		29	621	23.62	19	28.90	155	26.24	6.72	2.4	1.7	47	7	74	.15	5	0.3	0.8	39	KAO	
		29	7	6	34.18	19	56.57	156	28.08	33.44	3.5	4.0	54	11	232	.13	72	0.6	2.1	43	DIS
		29	2028	55.48	19	25.33	155	19.36	5.63	1.8	1.4	23	5	74	.13	3	0.5	0.9	17	KAO	
		29	2257	0.53	19	25.32	155	16.39	4.79	1.7	1.2	8	1	114	.06	1	0.9	0.6	0	SNC	L
		30	337	40.98	19	24.49	155	14.77	39.59	2.7	2.2	5	88	.10	7	1.0	1.0	1.7	DEP	L	
		30	557	44.13	19	15.44	155	29.56	8.35	1.2	33	6	62	.18	1	0.4	0.9	27	LSW		
		30	717	5.94	18	48.22	155	10.29	30.30	2.3	2.1	28	4	313	.10	50	1.8	2.4	24	LOI	
		30	1028	26.29	19	31.54	155	46.08	7.49	1.1	1.1	5	285	.06	2	1.4	0.6	7	KCN		
		30	1446	24.11	19	31.83	155	14.93	12.07	2.1	1.3	17	6	296	.10	13	2.5	2.7	1	CLN	L
		30	1550	24.98	18	55.89	155	19.28	14.05	1.5	20	3	244	.11	29	1.6	1.0	1.7	LOI		
		30	1631	1.52	19	20.71	155	13.98	34.80	2.0	2.2	44	6	57	.11	4	0.7	0.9	34	DEP	
		30	18	3	26.88	19	26.19	155	15.32	2.94	2.1	0.8	13	2	186	.18	3	0.6	1.0	8	SNC
		30	18	4	58.64	19	23.77	155	15.83	2.86	1.6		17	4	101	.09	1	0.3	0.4	8	SFC
		30	1811	17.60	19	19.42	155	12.03	8.12	1.6	1.5	26	1	92	.09	5	0.5	0.9	21	SF3	
		30	1837	17.27	19	25.16	155	15.82	9.66	2.0	1.3	17	2	164	.09	2	0.8	1.1	6	INT	L
		30	1840	14.64	19	27.89	155	6.27	26.63	2.5	1.8	16	2	324	.15	15	3.5	2.1	1.2	DEP	L
		30	2342	20.63	19	25.98	155	18.93	6.99	2.1	1.2	25	3	91	.12	3	0.6	0.8	19	INT	
		30	2352	4.01	19	24.64	155	29.94	10.51	1.7	1.2	24	1	70	.06	6	0.4	0.9	15	KAO	
		31	045	22.64	18																

YEAR	MON	DA	HR	MIN	SEC	ORIGIN TIME	LAT N	DEG	MIN	DEG	MIN	CON W	DEPTH	AMP	DUR	GAP	RMS	MIN	ERR	EPZ	NO	RM	RM	FM	REMARK
1988	AUG	2	234	25	68	19	20.09	155	10.49	7.67	2.1	2.2	53	8	85	.14	4	0.3	0.4	45	SF3				
		2	240	1.21	19	19.67	155	10.38	8.63	2.4	3.0	52	9	93	.12	5	0.4	0.3	45	SF3					
		2	314	28	62	19	21.53	155	7.75	8.48	2.8	3.0	60	13	74	.12	3	0.6	0.7	49	SF4				
		2	1055	7.94	19	14.08	155	29.20	8.88	2.7	3.4	50	8	134	.17	2	0.4	0.7	42	LSW					
		2	1225	8.99	19	21.05	155	20.19	28.19	1.6	36	8	55	.10	5	0.7	0.8	28	DEP						
		2	17	1	26	61	19	27.35	155	16.70	0.00	1.6	2.0	8	0	191	.11	4	2.0	4.2	1	SNC	L*		
		2	1741	31.43	19	13.95	155	33.95	7.99	1.6	18	1	87	.12	6	0.4	1.2	7	LSW						
		2	2135	3.14	19	25.65	155	15.58	11.90	2.0	1.9	19	3	148	.11	3	1.0	0.7	17	INT	L				
		2	22	0	30	45	19	21.10	155	8.11	8.72	0.9	1.6	40	8	74	.12	4	0.3	0.4	32	SF4			
		3	3	9	7	09	19	22.82	155	8.71	3.53	1.3	21	4	100	.16	2	0.9	0.5	17	SER				
		3	419	26	52	19	8.56	155	35.13	6.89	1.3	1.9	40	7	130	.16	12	0.4	1.1	34	LSW				
		3	751	17	07	19	24.39	155	17.32	9.38	1.9	2.4	16	2	62	.11	1	0.8	0.6	8	INT	L			
		3	810	0	26	19	22.11	155	15.96	32.67	2.0	46	.11	57	.10	1	0.7	0.6	36	DEP					
		3	1141	30	82	19	25.64	155	20.01	6.23	2.2	1.5	26	7	73	.12	4	0.4	0.8	16	KAO				
		3	1315	41	36	19	17.48	155	13.07	5.75	1.6	1.3	23	4	128	.09	1	0.5	0.7	19	SF2				
		3	1423	1.22	19	46.72	156	10.65	13.25	2.5	2.4	24	5	256	.13	37	1.0	0.9	13	HUA					
		3	1637	55	00	19	15.46	155	31.94	29.64	2.2	2.0	41	4	59	.08	3	0.5	0.8	30	DLS				
		3	2343	43	98	19	26.42	155	14.61	14.49	2.3	2.2	18	3	226	.11	3	1.2	0.6	16	DEP	L			
		4	1658	50	00	19	19.92	155	23.25	31.60	3.4	3.8	60	11	74	.12	1	0.5	0.6	43	DEP				
		4	17	5	54	44	19	19.83	155	23.09	31.86	2.3	3.3	64	19	77	.11	1	0.4	0.6	43	DEP			
		4	1856	25	14	19	19.39	155	22.50	36.15	2.0	1.6	26	0	85	.11	2	0.9	2.3	22	DEP				
		5	16	4	05	19	50.22	156	20.42	0.01	2.6	2.5	19	2	323	.10	35	3.8	1.3	16	DIS	*			
		5	19	2	1	60	19	24.96	155	16.22	14.77	3.0	3.5	26	5	73	.11	1	0.6	0.5	11	DEP	L		
		6	548	27	11	19	22.27	155	29.16	9.94	1.7	1.6	28	5	81	.10	3	0.4	0.6	22	KAO				
		6	547	29	77	19	25.62	155	17.94	5.43	1.5	1.7	13	1	155	.12	2	1.1	0.9	2	INT	L			
		6	8	1	0	65	19	24.48	155	17.64	6.90	2.1	2.1	11	3	100	.11	1	1.0	0.9	2	INT	L		
		6	1057	50	08	19	24.58	155	17.89	2.06	1.7	1.3	12	4	135	.12	2	0.4	0.6	7	SNC				
		6	1116	20	64	19	19.92	155	13.59	8.36	2.5	2.7	51	9	62	.12	5	0.3	0.5	43	SF2				
		6	12	4	57	76	19	21.41	155	4.62	6.72	1.7	1.7	30	4	85	.13	4	0.5	0.8	27	SF5			
		6	17	2	16	84	19	26.90	155	15.70	13.92	2.8	3.4	25	6	126	.15	4	0.9	0.8	18	DEP	L		
		6	1747	40	32	19	21.14	155	6.02	7.67	2.5	3.0	46	6	93	.12	5	0.5	0.6	39	SF4				
		6	1843	49	63	19	11.99	156	13.22	36.77	2.5	2.4	38	5	284	.09	45	1.4	1.9	33	KON				
		7	016	17	48	19	13.34	155	26.40	8.55	1.7	1.7	27	1	134	.11	5	0.4	0.9	15	LSW				
		7	6	1	52	97	19	24.15	155	17.58	8.88	2.4	2.9	11	0	105	.15	2	0.9	1.4	1	INT	L		
		7	1155	31	97	19	57.14	156	25.79	8.99	3.0	3.3	47	5	228	.11	68	1.1	1.8	30	DIS				
		7	12	3	30	74	19	22.06	155	5.23	7.94	1.7	1.9	30	1	75	.10	5	0.5	0.8	25	SF5			
		7	2211	53	42	19	24.21	155	15.24	11.21	2.1	2.0	16	2	81	.11	2	1.1	0.7	14	INT	L			
		8	838	52	63	19	22.36	155	28.46	10.13	1.7	1.7	45	7	37	.13	1	0.3	0.4	39	KAO				
		8	1545	2	39	20	4	22	156	28.88	6.93	1.8	23	2	315	.10	79	8.3	11.0	8	DIS	-			
		8	1648	10	71	19	19.13	155	15.40	6.41	1.5	1.8	32	2	92	.11	4	0.4	0.9	25	SF1				
		9	442	42	22	18	56.58	155	12.90	34.79	2.1	1.9	42	6	248	.12	36	1.4	1.4	38	LOI				
		9	1026	48	20	19	13.01	155	27.19	5.33	1.7	1.7	25	3	115	.15	6	0.5	2.3	21	LSW				
		9	1353	20	86	19	26.03	155	26.03	3.10	2.0	1.7	21	4	58	.11	2	0.3	0.6	17	KAO				
		9	1517	30	79	19	20.94	155	7.22	8.30	2.0	2.1	30	2	87	.09	4	0.4	0.6	18	SF4				
		9	2222	10	80	19	19.95	155	8.54	7.25	1.6	1.7	39	9	78	.12	5	0.4	0.5	32	SF4				

ORIGIN TIME		LAT N		LON W		DEPTH AMP DUR		GAP RMS MIN ERR				EPZ NO										
YEAR	MON	DA	HR	MIN	SEC	DEG	MIN	DEG	MIN	RM	NAG	NAG	NR	NS	DEG	SEC	DIS	RM	RM	RM	REMARK	
1988	AUG	10	541	10	39	19	22.49	155	4.29	10.44	1.7	1.3	37	6	90	.11	3	0.5	0.3	33	SF5	
		10	13	2	11	17	19	21.58	155	28.02	11.10	2.0	1.8	25	1	40	.10	2	0.5	0.8	19	KAO
		10	1610	37	61	19	14.50	155	28.37	6.31	2.0	2.2	31	2	82	.20	3	0.5	1.5	15	LSW	
		10	1743	39	59	19	14.58	155	27.87	6.32	1.7	1.2	21	2	88	.19	4	0.6	1.7	11	LSW	
		10	2324	50	69	19	57.21	155	44.76	33.83	2.5	2.6	46	6	150	.11	14	0.5	0.6	42	KOH	
		10	2336	10	15	19	19.74	155	23.37	32.33	2.1	2.1	52	7	76	.11	1	0.5	0.4	46	DEP	
		10	2341	35	00	19	12.38	155	29.57	8.80	2.5	2.6	42	3	130	.18	5	0.6	0.8	38	LSW F	
		11	120	32	59	19	14.51	155	28.05	7.06	1.7	1.6	34	3	86	.16	4	0.4	0.9	32	LSW	
		11	7	8	39	79	19	19.35	155	11.89	7.64	1.2	26	5	95	.12	5	0.4	0.7	22	SF3	
		11	2246	29	34	19	19.61	155	13.83	8.53	1.2	1.8	43	5	61	.15	5	0.3	0.4	41	SF2	
		12	636	47	26	19	18.63	155	27.61	10.19	1.3	37	6	45	.15	7	0.3	0.4	32	LSW		
		12	1722	17	69	19	19.33	155	13.42	8.07	1.6	1.7	41	7	72	.13	4	0.4	0.4	36	SF2	
		12	2142	56	73	19	32.98	155	30.45	41.37	2.5	4.5	26	4	90	.17	5	1.4	1.2	22	INT L	
		13	2	3	39	34	19	20.51	155	8.60	6.39	0.9	1.5	40	6	72	.18	4	0.4	0.6	34	SF4
		13	718	11	70	18	18.02	155	28.43	7.27	2.3	37	7	324	.12	78	8.0	10.4	30	DIS		
		13	941	36	80	19	22.89	155	49.90	10.70	1.3	28	4	124	.15	13	0.4	0.7	25	KON		
13	12	2	15	19	20	3	89	155	32.25	13.15	2.6	2.3	35	4	207	.15	26	0.7	0.5	33	KOA	
13	1347	13	70	19	34.26	155	41.84	9.77	2.7	2.5	50	12	63	.14	10	0.3	0.4	40	MLO			
13	1549	27	41	19	27.76	155	23.58	5.74	1.8	1.3	16	3	82	.11	4	0.4	1.0	9	KAO			
13	1620	47	45	20	12.26	156	30.07	8.73	4.5	4.6	52	6	235	.11	68	1.0	1.3	49	DIS			
13	1943	49	93	19	21.09	155	6.79	8.30	2.6	3.0	54	8	89	.13	4	0.5	0.4	46	SF4			
13	2045	52	56	19	19.82	155	10.60	7.51	1.6	1.5	44	7	91	.13	4	0.4	0.4	37	SF3			
13	2151	31	11	19	25.46	155	17.00	15.76	2.7	19	2	63	.19	1	1.2	0.7	17	DEP L				
14	4	8	43	89	19	20.33	155	10.90	5.58	1.9	1.4	37	5	81	.15	4	0.4	0.7	33	SF3		
14	429	57	01	19	26.70	155	11.59	14.78	1.6	1.2	13	5	298	.19	6	2.4	1.0	8	DEP L			
14	533	44	62	19	28.06	155	38.74	12.55	1.8	1.7	13	2	216	.08	12	1.3	1.1	9	MLO			
14	1812	55	67	19	13.86	155	27.25	6.85	1.7	1.9	23	2	107	.18	6	0.5	1.6	14	LSW			
14	19	4	15	94	19	52.51	155	7.75	38.56	3.3	3.7	63	18	211	.12	18	0.6	0.9	43	KOA		
15	424	23	54	19	20.10	155	8.77	8.11	2.4	2.8	52	6	72	.15	4	0.3	0.4	46	SF4			
15	614	30	38	19	21.01	155	1.47	1.63	2.9	4.0	40	3	175	.21	3	0.7	1.1	37	SSP			
15	1154	8	05	19	23.52	155	13.97	1.32	2.4	3.0	28	4	71	.14	2	0.3	0.3	25	SSR L			
15	1217	21	02	19	29.03	155	16.15	31.05	1.7	32	4	143	.08	2	1.1	0.7	28	DEP				
15	1948	16	51	19	23.95	155	15.83	3.13	1.5	15	1	73	.14	3	0.4	0.6	10	SEC				
15	23	0	29	03	19	21.76	155	2.94	8.69	2.1	2.3	45	8	117	.12	3	0.5	0.3	38	SF5		
16	548	21	13	19	26.78	154	55.58	8.11	1.8	2.3	42	5	145	.14	1	0.6	0.3	37	FER			
16	843	59	39	19	27.40	155	14.96	5.91	2.4	3.0	23	6	193	.19	3	0.9	1.3	17	INT L			
16	851	24	07	19	20.58	155	4.31	3.60	1.9	1.8	46	8	110	.19	3	0.4	1.1	38	SSP			
16	1444	39	62	19	19.41	155	8.31	5.94	1.2	21	6	86	.12	4	0.4	1.0	17	SF4				
16	1629	35	61	19	27.75	155	15.73	10.33	2.1	2.4	9	3	248	.14	6	3.0	2.1	0	INT L			
16	1814	22	28	19	25.58	155	15.17	16.41	2.3	2.9	12	3	192	.10	2	1.0	1.0	3	INT L			
16	1917	48	26	19	26.29	155	17.39	15.60	2.2	2.9	12	0	86	.10	2	0.6	0.8	2	DEP L			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48	28	19	10.34	155	32.05	39.37	2.0	1.6	22	2	185	.07	7	1.0	1.4	16	DIS			
16	1751	48																				

YEAR	MON	DA	HHRN	SEC	ORIGIN TIME	LAT N	DEG MIN	LONG W	DEG MIN	DEPTH	AMP	DUR	KM	MAG	MAG NR	NS	DEG	SEC	DIS	KM	KM	PM	REMARK
1988	AUG	28	20	8	39.84	19	19.66	155	11.85	8.51	2.1	1.9	36	2	89	.10	6	0.4	0.7	29	SF3		
		29	1050	49.99	19	23.79	155	26.67	10.09	1.9	1.7	29	2	33	.10	3	0.4	0.7	27	KAO			
		29	1529	50.90	19	16.23	155	20.21	5.58	2.4	2.3	11	4	287	.32	14	2.8	27.0	1	SMR	L-		
		29	2029	6.04	19	32.66	156	23.65	8.63	2.6	2.1	34	5	275	.20	50	1.3	1.4	29	DIS			
		30	010	35.73	19	19.76	155	16.83	6.50	1.8	1.5	42	8	94	.12	1	0.3	0.4	36	SF1			
		30	337	20.47	19	20.67	155	16.96	32.83	1.9	1.5	56	14	74	.12	1	0.6	0.4	42	DEP			
		30	744	25.06	19	36.13	156	25.66	10.26	2.9	50	6	279	.20	55	3	7	5.1	45	DIS			
		30	920	13.07	19	21.43	155	4.84	7.54	2.0	1.7	44	7	86	.16	4	0.6	0.5	38	SF5			
		30	930	19.41	19	19.95	155	11.99	7.88	2.7	3.2	61	13	82	.14	5	0.3	0.4	49	SF3	F		
		30	1919	36.89	19	25.17	155	15.22	0.04	1.9	1.1	8	2	278	.13	3	1.0	0.7	5	SNC	*		
		31	0	9	53.78	19	21.02	155	2.26	0.76	2.1	3.1	8	2	165	.09	2	0.6	1.1	6	SSF		
		31	1	7	9.94	19	24.24	155	15.88	1.91	1.5	1.6	15	2	108	.13	1	0.4	0.4	14	SEC	L	
		31	148	35.08	19	21.71	155	12.83	2.73	1.4	1.1	13	5	106	.06	2	0.5	0.5	8	SEB			
		31	255	11.89	19	22.94	155	30.70	9.56	1.7	1.4	22	4	70	.06	5	0.4	0.7	19	KAO			
		31	11	8	13.79	19	24.29	155	15.76	8.98	2.2	2.4	24	7	127	.12	2	0.8	0.5	15	INT	L	
		31	1514	20.57	19	22.12	155	28.65	4.03	2.3	2.3	23	2	49	.10	2	0.3	0.4	10	KAO			
		31	1710	11.72	19	28.56	155	27.22	6.40	1.9	1.3	30	3	71	.12	6	0.3	1.2	18	KAO			
		31	1848	10.56	19	23.97	155	15.92	2.99	1.9	1.3	17	3	74	.11	1	0.3	0.3	11	SEC			
SEP		1	036	53.50	19	12.03	155	30.31	3.93	1.8	1.2	31	4	78	.16	6	0.4	1.9	27	LSW			
		1	146	55.13	19	24.13	155	15.50	3.32	1.6	1.3	25	12	80	.12	2	0.3	0.4	14	SEC			
		1	2	1	25.63	19	23.97	155	15.74	3.38	2.0	2.0	34	11	75	.11	2	0.3	0.3	23	SEC		
		1	849	37.48	19	26.46	155	51.22	5.82	1.3	29	4	122	.19	9	0.5	2.1	25	KON				
		1	1452	6.32	19	52.06	155	41.20	11.78	2.2	2.0	13	1	123	.08	3	1.1	0.6	6	KBA			
		1	1457	46.05	19	20.31	155	11.60	8.24	1.9	1.4	26	5	79	.08	4	0.4	0.6	14	SF3			
		1	1518	44.13	19	20.72	155	11.36	8.14	2.4	2.4	45	6	73	.11	4	0.4	0.5	28	SF3			
		1	1935	27.18	19	22.24	155	26.55	10.75	2.2	2.6	50	6	40	.12	2	0.3	0.5	28	KAO			
		1	2341	40.24	19	26.20	155	22.37	9.07	2.2	1.7	55	15	40	.13	4	0.3	0.4	41	KAO			
		2	137	9.41	19	28.48	155	28.02	7.25	1.8	1.2	52	16	40	.14	7	0.3	0.7	37	KAO			
		2	137	30.71	19	28.34	155	27.47	5.90	2.0	1.4	41	6	55	.14	7	0.3	1.0	37	KAO			
		2	141	27.33	19	20.59	155	6.61	8.26	3.2	3.5	64	16	101	.12	5	0.3	0.3	48	SF4			
		2	3	4	34.34	19	25.56	155	20.41	7.33	2.0	1.2	33	10	64	.14	4	0.4	0.6	23	KAO		
		2	5	7	26.16	19	24.83	155	19.56	7.13	2.4	1.9	40	7	37	.12	2	0.3	0.5	35	KAO		
		2	5	9	17.35	19	24.67	155	19.67	7.60	1.9	1.2	38	9	60	.12	2	0.4	0.4	29	KAO		
		2	5	9	41.88	19	25.05	155	19.69	7.50	2.1	2.6	55	15	56	.12	2	0.3	0.4	40	KAO		
		2	527	28.50	19	25.07	155	19.58	6.63	2.0	1.4	40	10	63	.12	3	0.3	0.5	30	KAO			
		2	1259	51.61	19	19.73	155	10.75	7.53	1.6	1.2	22	3	93	.09	5	0.5	0.8	13	SF3			
		2	1631	56.40	19	22.15	155	30.12	9.60	1.7	1.6	35	4	58	.08	4	0.3	0.5	30	KAO			
		2	1638	5.98	19	25.37	155	24.01	8.91	2.1	1.9	39	7	46	.11	2	0.3	0.6	33	KAO			
		2	1826	8.18	19	25.07	155	16.07	15.93	2.1	1.5	36	7	112	.08	2	0.6	0.4	29	DEP			
		2	2316	43.65	20	1.43	155	47.82	22.35	2.6	2.3	48	4	176	.08	12	0.7	1.2	43	KOH			
		3	3	6	56.06	19	25.77	155	16.38	10.49	2.7	3.1	21	5	127	.09	2	0.8	0.7	16	INT	L	
		3	521	23.45	19	21.95	155	28.03	3.78	1.9	1.7	24	4	106	.10	1	0.4	0.4	20	KAO			
		3	554	15.02	19	26.04	155	30.10	9.69	1.7	1.2	25	3	84	.09	8	0.4	0.9	21	KAO			
		3	7	8	9.49	19	21.15	155	5.78	0.03	1.7	1.8	9	2	168	.15	5	0.6	0.6	4	SSF	*	
		3	9	0	46.61	19	22.20	155	28.94	10.58	1.7	1.2	31	6	40	.11	2	0.4	0.6	23	KAO		

YEAR	MON	DA	HHRN	SEC	ORIGIN TIME	LAT N	DEG MIN	LONG W	DEG MIN	DEPTH AMP DUR	KM	MAG	MAG NR	NS	DEG	SEC	DIS	KM	KM	PM	REMARK		
1988	SEP	3	1129	10.66	19	18.25	155	48.59	10.72	2.0	1.1	27	2	134	.13	8	0.6	0.5	24	KON			
		3	1142	48.32	19	24.21	155	17.34	2.11	1.4	1.5	4	0	203	.00	1	1.3	0.8	0	SSC	L		
		3	1825	14.13	19	19.70	155	9.89	7.61	1.6	1.4	21	3	90	.05	4	0.4	0.9	12	SF3			
		3	1859	43.15	18	50.50	155	11.67	20.18	1.7	14	0	281	.09	45	6.9	11.2	1	LOT	-			
		4	120	2.01	19	24.37	155	17.42	6.45	1.9	12	0	62	.26	1	1.3	2.4	1	INT	L			
		4	1358	30.65	19	25.39	155	12.75	6.12	2.7	24	6	170	.21	3	0.8	1.7	18	SF2	L			
		4	1438	37.31	20	3.91	155	47.95	30.91	1.4	1.6	26	4	185	.10	7	1.0	0.9	22	KON			
		4	1934	42.55	19	26.31	155	24.10	7.85	2.1	1.7	46	11	56	.11	3	0.3	0.5	34	KAO			
		4	2115	6.14	19	23.80	155	22.48	7.51	1.9	1.6	14	5	311	.27	5	2.3	3.1	3	KAO	L		
		4	2159	7.58	19	25.07	155	14.08	1.80	2.3	2.9	25	5	168	.16	1	0.4	0.3	20	SNC	L		
		4	2236	39.02	19	25.46	155	14.89	0.01	1.8	1.4	17	3	206	.19	2	0.5	0.8	14	SNC	L*		
		4	2337	13.47	19	24.86	155	17.30	13.63	2.5	3.0	18	3	70	.19	1	1.3	0.9	15	DEP	L		
		5	125	13.92	19	27.01	155	14.95	11.18	2.1	1.9	17	3	222	.15	3	1.4	0.6	14	INT	L		
		5	325	32.08	19	25.29	155	15.50	11.41	2.2	21	6	142	.14	2	1.0	0.5	15	INT	L			
		5	433	33.77	19	27.53	155	16.83	6.01	2.1	2.3	16	3	99	.11	1	0.5	0.9	2	INT	L		
		5	518	52.54	19	14.17	155	25.99	8.27	1.7	1.2	34	4	116	.13	3	0.3	0.5	31	LSW			
		5	546	33.40	19	27.54	155	14.65	10.71	2.4	2.8	11	1	245	.23	4	3.5	5.5	0	INT	L		
		5	556	53.12	19	30.72	155	19.93	10.90	2.1	1.8	10	3	299	.12	6	1.7	1.6	0	MLO	L		
		5	610	34.81	19	26.78	155	13.79	18.14	2.5	2.2	17	2	210	.10	4	1.6	0.9	16	DEP	L		
		5	619	3.81	19	19.55	155	11.43	7.04	1.6	1.6	40	7	95	.12	5	0.3	0.6	35	SF3			
		5	628	14.11	19	26.54	155	15.47	0.03	2.0	2.0	9	3	192	.11	3	0.4	0.9	2	SNC	L*		
		5	630	7.74	19	24.11	155	16.01	9.35	2.2	2.2	17	4	79	.26	1	1.9	1.2	2	INT	L		
		5	651	45.43	19	23.80	155	16.40	12.95	2.3	2.5	19	3	68	.17	0	1.1	1.0	16	INT	L		
		5	7	5	47.30	19	25.68	155	15.63	10.37	2.2	2.4	25	8	154	.17	3	0.9	0.5	17	INT	L	
		5	734	33.38	19	23.75	155	17.52	9.67	2.1	2.3	16	6	138	.24	1	1.8	0.9	10	INT	L		
		5	737	10.39	19	25.90	155	14.16	14.41	2.4	2.4	11	2	239	.12	2	1.7	1.5	2	DEP	L		
		5	759	23.41	19	29.47	155	15.57	13.36	2.4	2.1	9	3	272	.09	4	2.0	1.5	2	DEP	L		
		5	810	42.71	19	27.50	155	14.68	10.80	2.3	1.9	15	1	236	.28	4	2.5	1.6	1	INT	L		
		5	812	6.15	19	22.95	155	16.02	0.15	1.8	1.4	9	2	124	.15	1	0.4	0.4	4	SNC	L		
		5	828	13.45	19	27.58	155	19.22	19.82	2.5	2.6	12	3	258	.08	4	2.2	1.0	2	DHL	L		
		5	830	7.36	19	25.87	155	18.73	5.09	2.1	2.4	14	2	134	.14	2	1.3	0.5	0.7	1	INT	L	
		5	840	39.75	19	25.26	155	16.94	11.18	2.1	2.3	15	4	98	.13	1	1.4	0.7	12	INT	L		
		5	851	11.52	19	28.53	155	6.96	5.97	2.1	1.7	7	1	297	.15	13	2.3	14.0	0	GN	L*		
		5	854	47.15	19	30.61	155	18.78	12.18	2.2	1.8	9	2	317	.06	6	2.8	1.2	1	GN	L		
		5	9	3	17.06	19	27.69	155	15.98	7.08	2.2	2.5	17	5	216	.23	1	1.1	1.5	1	INT	L	
		5	920	59.37	19	24.08	155	15.66	8.98	2.2	2.3	11	1	117	.04	2	1.0	1.8	0	INT	L		
		5	924	29.43	19	26.71	155	15.12	1.81	1.9	1.8	9	3	212	.08	3	0.3	0.7	1	SNC	L		
		5	2018	55.88	19	20.66	155	13.64	9.09	1.5	1.2	22	1	64	.07	4	0.5	0.9	17	SF2			
		5	2020	54.55	19	2.66	156	16.10	43.66	1.7	21	2	296	.10	48	2.0	1.9	13	KON				
		5	2031	9.13	20	18.41	156	37.29	15.34	2.6	2.1	11	3	256	.11	64	6.3	7.7	1	DIS			
		6	450	42.31	19	24.19	155	16.86	14.58	2.2	1.8	20	4	76	.14	1	0.9	0.7	17	DEP	L		
		6	617	22.24	19	24.98	155	16.04	13.65	2.2	1.8	21	3	112	.11	2	0.8	0.6	18	DEP	L		
		6	918	1.14	19	21.25	155	1.86	9.40	3.8	4.0	26	4	173	.10	3	0.6	0.4	13	SF5	F		
		6	1220	4.21	19	19.36	155	9.73	7.75	1.6	1.5	20	0	113	.09	5	0.6	0.8	20	SF3			
		6	1833	0.66	19	24.20	155	15.77	3.51	1.6	1.1	17	6	83	.10	2	0.4	0.4	10	SNC			

YEAR	MON	DA	HR:MM	SEC	DEG	MIN	LAT	N	W	DEPTH	AMP	DIR	GAP	RMS	MIN	ERH	ERZ	NO			
1988	OCT	2	18:15	23:82	19	45.51	155	21.04	31.51	2.3	2.3	44	10	95	.09	12	0.5	1.0	30	KEA	
		3	01:8	52:82	19	23.94	155	15.89	3.06	1.9	1.6	31	11	73	.11	1	0.3	0.2	20	SF2	
		3	5	27:22	19	28:59	155	24.10	14.53	3.1	3.9	62	12	26	.12	3	0.4	0.2	49	DML	
		3	12:57	14:00	19	26:17	155	15.95	14.72	2.6	2.8	15	2	148	.12	3	1.0	0.9	0	DEP L	
		3	15:30	49:22	19	25:28	155	17.24	12.36	2.1	1.8	17	4	175	.13	1	1.5	0.6	1	INT L	
		3	18:43	35:81	19	26:74	155	13.74	14.90	2.3	1.9	15	4	242	.12	4	2.0	0.7	2	DEP L	
		4	4:18	4:70	19	21:08	155	1.46	6.00	2.1	2.1	30	3	188	.12	3	0.5	0.5	19	SF5	
		4	4:54	44:62	19	25:20	155	29.46	9.28	1.7	1.2	25	1	38	.09	6	0.3	1.1	22	KAO	
		4	5	0	20:52	19	27:26	155	20.82	0.03	1.8	1.9	9	2	275	.17	7	2.4	2.5	0	KAO L*
		4	6	3	3:49	19	25:22	155	21.58	13.28	2.3	2.4	13	3	262	.26	5	3.9	1.4	0	DML L
		4	6:40	31:23	19	25:45	155	16.16	8.53	0.8	2.1	15	3	124	.25	2	1.3	2.2	1	INT L	
		4	6:44	30:26	19	22:55	155	25.79	10.87	1.8	1.2	27	2	42	.10	3	0.4	0.8	19	KAO	
		4	7:37	13:44	19	23:36	155	15.86	12.69	2.1	1.8	17	5	78	.12	2	1.0	0.7	15	INT L	
		4	8:49	49:10	22	6:60	156	25.91	30.90	3.8	4.0	54	9	268	.12185	0.8	1.5	46	DIS		
		4	9:35	57:15	19	23:46	155	17.64	10.45	2.3	2.4	22	6	89	.20	1	1.1	0.9	16	INT L	
		4	12:11	1:66	19	26:17	155	13.40	7.96	2.1	1.7	14	4	237	.07	3	0.8	1.5	1	GUN L	
		4	18	4	4:67	19	25:38	155	16.83	7.05	2.5	3.0	21	4	65	.18	1	0.6	0.5	1	INT L
		4	19:53	14:21	19	24:64	155	15.37	3.61	1.8	1.5	17	3	108	.12	2	0.6	0.5	14	SNC L	
		4	22:12	13:79	19	17:36	155	21.57	8.57	1.6	1.5	38	4	126	.12	5	0.4	0.5	36	SWR	
		4	23:53	33:59	19	23:76	155	16.27	7.81	2.0	1.8	11	4	102	.12	1	1.1	0.8	8	INT L	
		5	2:39	4:73	19	19:66	155	8.77	6.87	0.9	1.5	34	7	79	.08	5	0.4	0.5	29	SF4	
		5	3:56	31:29	19	24:28	155	17.33	7.19	2.1	2.0	15	6	98	.13	1	0.9	0.7	4	INT L	
		5	4:44	27:14	19	25:48	155	17.18	5.37	1.6	1.5	11	3	137	.09	1	0.5	0.9	7	INT L	
		5	7:55	26:86	19	25:51	155	16.16	14.46	2.1	2.1	14	3	127	.05	2	1.3	0.9	1	DEP L	
		5	8:40	51:50	19	27:53	155	28.55	9.11	2.2	2.0	43	8	49	.10	7	0.3	0.7	24	KAO	
		5	10	2	46:43	19	29:60	155	54.33	9.63	2.5	1.9	24	3	187	.20	1	1.4	0.7	15	KCN
		5	12:23	49:81	19	20:74	155	29.72	10.57	2.2	1.9	34	3	36	.11	5	0.3	0.8	22	KAO	
		5	15:49	48:10	19	27:23	155	28.33	8.30	2.0	1.6	37	5	55	.12	7	0.3	0.8	21	KAO	
		5	16:19	1:05	19	13:19	155	25.75	7.07	1.2	1.2	0	154	.08	4	0.7	1.2	5	LSW		
		5	18:19	40:21	19	23:24	155	9.20	2.25	1.5	1.1	11	1	121	.10	2	1.5	1.3	6	SER	
		5	18:34	22:98	19	42:26	155	56.73	14.84	1.5	1.0	0	320	.07	29	12.6	1.9	6	HUR		
		5	23:25	20:66	19	26:63	155	14.83	10.03	1.9	1.6	23	6	190	.19	4	1.3	0.7	17	INT L	
		6	6:27	45:93	20	4:44	155	20.89	10.24	1.5	1.7	3	236	.06	20	1	0.8	15	KEA		
		6	7:10	8:23	19	22:68	155	3.59	9.02	2.8			59	13	100	.12	3	0.4	0.3	46	SF5 F
		6	17	6	3:11	19	21:24	155	6.32	7.23	0.8	1.2	20	0	90	.10	4	0.6	1.3	14	SF4
		6	21:41	39:30	19	24:56	155	29.93	8.56	2.0	1.4	44	5	33	.12	6	0.3	0.6	42	KAO	
		7	7:32	8:75	19	12:00	155	26.95	4.46	1.4	37	3	127	.15	5	0.4	1.7	35	LSW		
		7	23:44	37:09	19	25:44	155	19.37	5.94	2.0	1.4	35	12	77	.14	3	0.4	0.6	22	KAO	
		8	0:41	27:08	19	12:21	155	27.32	5.39	1.8	1.4	36	3	117	.14	5	0.4	1.2	34	LSW	
		8	0:44	16:07	19	12:14	155	27.49	6.55	1.8	1.4	38	2	114	.14	5	0.4	0.8	39	LSW	
		8	15:25	15:95	19	18:62	155	18.32	6.87	1.8	1.4	26	4	138	.09	1	0.5	0.6	21	SWR	
		8	16	5	8:85	19	19:74	155	11.87	8.97	2.5	2.4	50	7	88	.12	6	0.5	0.3	46	SF3
		8	17:44	57:42	19	17:57	155	20.62	9.62	1.6	1.3	31	6	131	.13	4	0.4	0.5	26	SWR	
		8	18	2	50:93	19	21:09	155	2.88	7.38	1.2	1.5	39	6	134	.13	2	0.4	0.4	34	SF5
		8	19	3	3:81	19	21:98	155	30.51	8.73	2.0	2.4	45	5	32	.14	5	0.3	0.6	41	KAO

YEAR	MON	DA	HR:MM	SEC	DEG	MIN	LAT	N	W	DEPTH	AMP	DIR	GAP	RMS	MIN	ERH	ERZ	NO				
										RM	MAG	MAG	NR	NS	DEG	SEC	DIS	RM	RM	FM	REMARK	
1988	OCT	9	4:38	46:37	19	50:36	155	52.89	25.63	1.4	1.9	4	192	.11	17	1.6	1.0	15	HIA			
		9	4:52	49:54	19	19:57	155	13.33	8.69	1.9	2.1	55	9	70	.14	5	0.3	0.3	47	SF2		
		9	5:20	54:54	19	21:29	155	3.83	7.00	1.6	1.3	37	3	96	.11	3	0.4	0.5	36	SF5		
		9	16:25	35:48	20	6:83	155	22.73	7.92	1.5	1.6	3	241	.11	25	0.7	1.0	15	KEA			
		9	19:11	52:10	19	24:12	155	16.07	2.85	1.4	0.9	22	7	79	.09	1	0.3	0.2	15	SEC		
		9	19:16	58:87	19	19:31	155	11.63	8.22	2.5	2.7	56	8	99	.13	5	0.3	0.3	47	SF3		
		9	21:28	15:75	19	19:63	155	6.80	7.96	0.9	1.2	37	2	121	.11	5	0.5	0.5	35	SF4		
		10	14:7	37:87	19	28:39	155	9.08	24.19	2.1	1.6	12	2	315	.14	11	3.5	2.7	0	DEP	L	
		10	34:8	35:27	19	18:22	154	59.32	36.59	1.0	1.5	47	3	205	.11	7	1.2	0.8	45	LER		
		10	18:51	11:22	19	56:41	156	34.02	27.41	2.5	1.1	1	341	.04	81	4.3	5.3	4	DIS			
		10	23:17	19:65	19	30:74	155	15.76	23.84	2.5	2.6	63	14	49	.11	6	0.4	0.5	48	DEP		
		11	04:0	53:34	19	45:26	155	34.85	20.02	2.0	2.0	42	3	163	.11	13	0.7	0.9	39	KEA		
		11	8	0	2:27	19	20:38	155	17.05	33.62	2.1	1.9	63	16	78	.13	1	0.7	0.4	47	DEP	
		11	20:23	55:61	19	10:45	155	32.22	3.52	1.8	1.9	39	4	110	.14	8	0.4	1.5	38	LSW		
		11	21:39	42:07	19	12:43	155	19.48	48.62	1.9	2.5	6	199	.08	10	1.5	0.9	18	DEP	L		
		12	0:23	22:78	19	24:61	155	29.03	9.05	1.4	38	4	31	.12	5	0.3	0.5	35	KAO			
		12	11:7	49:29	19	20:40	155	12.53	8.57	2.1	2.7	55	8	70	.14	4	0.4	0.3	50	SF2		
		12	131	56:95	19	30:64	155	21.49	45.55	2.9	3.3	66	17	48	.13	4	0.5	0.5	50	DML		
		12	44:8	0:19	21	8:06	156	15.93	35.07	2.1	3.4	32	6	335	.12123	2.1	2.2	27	DIS			
		12	5:34	15:19	19	19:19	155	9.79	8.03	1.6	1.6	41	8	103	.12	5	0.4	0.5	35	SF3		
		12	6:48	34:56	19	19:57	155	6.22	7.38	2.0	1.7	39	6	134	.12	5	0.4	0.6	33	SF4		
		12	8:39	21:72	19	9:88	155	31.78	1.92	2.1	1.8	44	6	121	.14	7	0.3	0.6	40	LSW		
		12	10:23	9:45	18	57:36	155	3.82	34.42	1.7	38	7	278	.12	38	1.9	2.2	31	LOI			
		12	16:47	50:26	19	20:56	155	11.53	8.40	2.1	2.1	40	5	75	.10	4	0.4	0.5	28	SF3		
		12	19:24	18:96	19	21:65	155	31.93	12.67	2.6	2.6	29	4	51	.06	8	0.4	0.9	20	KAO		
		13	6	4	59:19	19	19:45	155	11.50	5.84	1.6	1.7	40	8	96	.16	6	0.4	0.8	32	SF3	
		13	18:58	28:74	19	9:43	155	36.13	2.28	2.0	1.9	34	2	110	.15	10	0.6	2.0	22	LSW		
		13	19	8	53:96	19	20:27	155	4.05	6.75	1.7	1.6	19	3	123	.07	2	0.5	0.9	11	SF5	
		13	20:20	31:86	19	23:88	155	15.47	2.58	1.4	1.3	15	5	105	.07	2	0.3	0.5	7	SEC		
		13	22:37	34:02	19	2:40	155	25.95	36.55	1.4	1.6	46	6	205	.09	14	0.9	0.7	42	ILS		
		14	120	34:62	19	20:02	155	46.70	11.37	2.0	1.5	36	4	113	.13	12	0.4	0.4	34	KON		
		14	9:37	31:68	19	12:82	155	19.15	53.18	2.1	3.5	23	3	227	.09	10	1.1	0.9	1	DEP	L	
		14	18:17	24:34	19	26:81	155	28.56	9.19	2.0	1.8	41	6	43	.11	7	0.3	0.7	34	KAO		
		15	34:3	36:23	19	25:58	155	20.72	5.77	2.1	1.5	31	6	48	.11	4	0.4	0.9	25	KAO		
		15	5	1	53:46	19	25:79	155	20.57	5.01	1.8	1.7	26	4	64	.11	3	0.4	1.0	22	KAO	
		15	9:36	27:82	19	27:15	155	30.27	12.00	2.2	1.3	31	5	46	.10	6	0.4	0.9	28	KAO		
		15	13:55	41:00	19	13:21	155	26.44	8.87	2.3	2.8	42	2	128	.11	5	0.4	0.6	41	LSW	F	
		16	6:21	3:76	19	19:33	155	12.11	8.37	1.4	26	3	94	.09	5	0.4	0.8	16	SF3			
		16	16:58	26:11	19	19:99	155	11.73	8.78	2.4	2.2	25	0	83	.09	5	0.4	0.5	26	SF3		
		16	18	4	10:32	19	22:03	155	3.13	5.55	1.7	1.7	21	1	121	.15	4	0.8	1.6	20	SF5	
		16	18:32	11:82	19	26:94	155	23.52	6.89	1.8	1.2	19	1	72	.08	4	0.4	1.0	10	KAO		
		16	20:40	46:63	19	20:87	155	3.90	7.66	2.8	3.1	50	7	92	.12	2	0.4	0.4	41	SF5	F	
		17	11	9	9:24	19	21:18	155	30.19	9.11	1.2	41	5	36	.12	5	0.3	0.6	36	KAO		
		17	15	7	46:89	19	19:79	155	17.31	34.60	1.7	22	0	88	.08	1	0.9	2.0	18	DEP		
		17	17	1	9:07	19	20:49	155	9.06	7.36	0.9	1.5	27	1	70	.10	3	0.5	1.0	21	SF4	

YEAR	MON	DA	HRMN	SEC	LAT	N	DEG	MIN	LON	W	DEPTH	AMP	DUR	RM	MAG	NR	NS	DEG	SEC	DIS	RM	RM	PM	REMK
1988	OCT	17	17	8	28.93	19	19.75	155	11.07	7.36	0.9	1.8	26	1	91	.12	5	0.5	1.0	21	SF3			
		17	1858	14.65	19	20.81	155	2.75	6.81	0.9	1.6	26	5	139	.12	2	0.4	0.5	25	SF5				
		18	320	42.08	19	12.67	155	30.21	10.26	1.8	35	5	69	.14	4	0.5	0.5	30	LSW					
		18	735	42.32	19	12.45	155	30.11	9.33	1.8	28	3	71	.13	5	0.4	0.7	25	LSW					
		18	741	50.89	19	12.93	155	30.18	6.77	1.6	20	0	69	.13	8	0.5	2.3	19	LSW					
		18	750	59.58	19	12.43	155	30.43	9.86	1.2	28	3	74	.14	5	0.4	0.7	26	LSW					
		18	835	30.84	19	18.64	155	30.96	9.38	1.6	34	6	71	.12	7	0.4	0.7	29	LSW					
		18	842	53.64	19	12.72	155	30.06	10.14	2.2	36	6	70	.14	4	0.4	0.7	31	LSW					
		18	2333	40.62	19	19.09	155	11.29	7.80	2.6	2.6	51	11	107	.14	5	0.3	0.3	43	SF3				
		19	235	54.26	20	3.67	155	34.04	30.13	1.5	1.9	42	4	200	.10	23	0.9	0.6	40	KO				
		19	2254	19.96	19	12.37	155	38.59	4.30	1.9	2.7	46	6	100	.17	16	0.4	1.6	40	LSW				
		20	118	50.22	19	21.13	155	13.37	1.59	1.6	33	9	56	.19	3	0.2	0.4	24	SER					
		20	848	57.93	19	21.33	155	18.66	30.20	2.9	3.6	67	21	44	.13	3	0.5	0.4	46	DEP				
		20	1059	20.17	19	21.99	155	1.56	8.03	1.3	2.2	24	1	165	.11	5	0.9	0.6	23	SF5				
		20	1844	7.04	18	56.08	155	28.08	39.61	1.9	45	5	241	.09	21	1.0	0.7	40	DLS					
		20	2027	25.96	19	19.28	155	13.87	7.50	0.9	1.2	40	8	73	.12	4	0.4	0.4	32	SF2				
		20	2240	36.01	19	19.91	155	10.68	7.94	0.9	1.2	37	7	89	.11	4	0.4	0.5	31	SF3				
		21	347	2.44	19	19.47	155	11.14	7.76	1.2	37	7	97	.15	5	0.4	0.5	30	SF3					
		21	1521	46.18	19	29.14	155	26.83	7.73	1.4	1.5	31	7	73	.10	6	0.3	0.8	18	KAO				
		21	23	7	40.62	19	21.27	155	4.61	7.39	1.4	2.0	42	4	89	.13	4	0.4	0.4	38	SF5			
		22	017	20.83	19	23.00	155	27.60	9.95	1.6	39	3	34	.11	1	0.3	0.4	37	KAO					
		22	132	29.26	19	24.96	155	19.35	6.73	1.3	27	7	78	.12	2	0.4	0.7	20	KAO					
		22	732	23.15	19	58.27	155	28.99	41.95	1.6	20	3	181	.11	17	1.1	0.9	18	KEA					
		22	1932	35.92	19	19.12	155	13.55	7.97	0.9	1.3	27	1	78	.09	4	0.4	0.8	19	SF2				
		22	2050	33.22	19	24.39	155	17.26	1.98	2.0	1.3	14	3	71	.09	1	0.3	0.2	7	SSC				
		22	22	9	21.50	19	12.13	155	27.93	6.15	2.1	1.7	30	2	104	.14	5	0.4	1.2	19	LSW			
		23	735	15.63	19	12.37	155	27.23	9.66	2.7	3.1	49	13	118	.15	5	0.4	0.6	38	LSW				
		23	1544	28.58	19	23.87	155	15.38	3.11	1.1	13	2	79	.04	2	0.3	0.4	7	SEC					
		23	1644	27.55	19	25.47	155	29.53	9.90	1.0	1.6	31	1	38	.08	6	0.4	0.8	18	KAO				
		23	2010	54.50	19	19.88	155	12.76	6.34	1.1	36	6	75	.15	5	0.4	0.6	30	SF2					
		23	2016	52.31	19	18.26	155	48.76	9.88	1.9	37	4	96	.18	7	0.6	0.6	33	KON					
		23	2353	28.65	19	22.16	155	29.94	8.95	1.1	1.7	41	3	33	.13	4	0.3	0.5	39	KAO				
		24	659	59.67	19	18.78	155	13.70	7.42	0.9	1.8	36	5	74	.13	3	0.4	0.5	33	SF2				
		24	813	1.49	19	23.12	155	14.67	3.14	2.2	1.8	30	8	77	.10	3	0.3	0.3	24	SEC				
		24	1531	12.03	19	49.52	154	55.56	7.04	2.8	3.0	14	2	324	.12	56	2.2	2.0	1	KEA				
		24	2258	28.37	19	21.17	155	13.30	8.03	2.3	2.3	42	4	56	.13	3	0.4	0.4	38	SF2				
		24	2320	31.68	19	26.30	154	56.00	5.15	1.3	1.3	29	3	178	.15	5	0.8	0.9	26	LER				
		24	2322	59.64	19	16.49	155	25.92	8.71	1.2	32	5	55	.14	3	0.4	0.6	28	LSW					
		24	2347	4.00	19	19.03	155	8.83	6.99	0.9	1.4	42	9	90	.12	3	0.3	0.5	34	SF4				
		25	020	7.65	19	28.26	155	25.60	6.89	2.6	1.6	41	6	59	.12	5	0.3	0.7	36	KAO				
		25	1445	29.30	19	34.96	155	42.95	10.44	2.2	1.4	30	2	100	.14	10	0.6	0.7	19	MLO				
		25	1529	18.93	19	22.13	155	28.84	9.18	2.3	2.0	40	1	36	.13	2	0.4	0.6	30	KAO				
		25	2354	18.87	19	24.22	155	17.34	2.14	2.1	1.5	23	10	55	.13	1	0.3	0.2	13	SSC				
		26	436	38.86	19	26.83	154	51.91	44.09	1.0	1.8	48	5	215	.09	6	1.2	0.5	43	LER				
		26	523	58.07	19	25.62	155	18.03	14.32	2.0	1.8	20	4	79	.13	1	1.1	0.6	16	DEP				

YEAR	MON	DA	HRMN	SEC	DEG	MIN	LAT	N	W	DEPTH	AMP	DUR	RM	MAG	NR	NS	DEG	SEC	DIS	RM	PM	REMK
1988	OCT	26	19	2	59.17	19	21.38	155	30.18	9.36	1.9	1.7	33	1	45	.09	5	0.3	0.6	21	KAO	
		27	457	39.95	19	24.70	155	16.82	14.78	2.7	3.0	19	3	88	.10	0	1.0	0.6	17	DEP L		
		27	554	51.97	19	14.36	155	26.21	8.95	1.7	1.4	43	6	108	.15	4	0.4	0.5	37	LSW		
		27	13	5	45.42	19	23.73	155	14.96	3.14	2.0	1.6	18	3	77	.09	2	0.3	0.4	15	SEC	
		27	2241	56.48	19	19.28	154	56.92	10.87	1.8	1.8	33	4	227	.17	11	1.1	0.6	29	LER		
		27	23	5	52.72	19	11.86	155	28.32	3.88	2.1	1.8	44	4	112	.16	4	0.4	1.5	41	LSW	
		28	818	23.32	19	24.90	155	18.94	5.82	1.7	1.2	26	6	67	.11	3	0.4	0.6	20	INT		
		28	944	23.06	19	19.45	155	8.93	7.03	1.4	37	6	85	.12	4	0.4	0.6	32	SF4			
		28	958	27.39	19	25.34	155	21.95	10.99	2.0	1.6	48	9	36	.13	5	0.3	0.4	40	KAO		
		28	12	3	10.92	19	11.04	155	35.39	6.52	1.4	23	0	98	.21	8	0.7	2.4	11	LSW		
		28	1620	4.61	19	11.93	155	33.15	9.55	3.8	4.1	56	14	168	.19	8	0.6	0.7	42	LSW F		
		28	1628	36.03	19	12.31	155	32.62	8.26	1.8	1.9	33	1	131	.14	7	0.6	1.1	33	LSW		
		28	1635	36.02	19	12.39	155	32.32	5.44	1.6	27	1	85	.14	6	0.5	1.7	26	LSW			
		28	1643	51.66	19	12.22	155	32.35	6.20	1.2	24	1	87	.15	7	0.6	1.8	23	LSW			
		28	2028	11.84	20	9.80	154	45.74	6.49	3.5	3.5	49	9	279	.13	58	0.8	0.9	40	KEA		
		29	332	1.54	19	22.22	155	29.82	9.60	1.7	1.2	40	5	44	.14	4	0.4	0.6	35	KAO		
		29	1653	37.57	19	57.81	155	33.97	18.94	1.6	31	6	159	.08	15	0.6	1.1	24	KEA			
		29	1655	3.28	19	16.00	155	31.27	6.91	2.4	2.2	45	6	53	.19	10	0.4	1.1	38	LSW		
		30	243	44.03	19	20.03	155	9.05	8.03	1.9	1.7	40	4	77	.09	4	0.4	0.5	36	SF4		
		30	15	8	0.11	19	28.96	155	13.28	11.17	2.3	1.8	7	1	278	.07	8	2.8	3.2	0	CLN L	
		30	2227	48.46	19	20.51	155	23.29	10.29	1.9	1.5	42	5	61	.13	1	0.4	0.4	37	SAR		
		31	1	0	40.94	19	22.23	155	27.68	6.16	1.6	1.4	28	4	48	.10	1	0.4	0.5	24	KAO	
		31	210	6.32	19	19.73	155	10.16	8.58	2.2	2.5	52	8	92	.12	4	0.3	0.3	45	SF3		
		31	1023	17.00	19	19.21	155	16.18	7.32	1.5	1.2	26	5	107	.10	3	0.4	0.7	20	SF1		
		NOV	1	211	56.75	19	20.46	155	7.41	7.96	1.8	2.0	42	4	93	.10	5	0.4	0.5	39	SF4	
		1	440	12.31	19	21.77	155	28.27	10.01	3.2	3.7	66	18	39	.13	2	0.3	0.4	48	KAO F		
		1	9	7	48.20	19	12.70	155	31.24	8.55	2.5	2.9	48	7	76	.15	5	0.4	0.8	41	LSW F	
		1	1616	8.13	19	19.99	155	8.46	7.49	2.1	2.0	40	5	78	.10	5	0.4	0.7	25	SF4		
		2	844	53.21	19	23.08	155	17.96	12.08	2.8	18	3	72	.11	2	0.8	1.0	15	INT L			
		2	1134	19.19	19	12.12	155	31.11	8.48	1.8	1.2	28	0	151	.13	6	0.6	1.3	16	LSW		
		2	1224	28.26	19	19.10	155	13.15	6.15	1.5	1.3	28	1	80	.11	4	0.4	1.0	22	SF2		
		2	1232	23.68	19	21.66	155	30.16	9.83	1.7	1.2	25	1	46	.05	5	0.3	0.7	18	KAO		
		2	20	0	26.27	19	19.54	155	11.82	8.12	1.6	1.6	33	2	92	.08	5	0.4	0.8	23	SF3	
		3	533	9.12	19	34.08	155	41.23	10.14	2.2	1.7	38	4	95	.13	10	0.4	0.7	34	WLO		
		3	1042	8.55	19	22.19	155	29.88	9.42	2.0	1.9	40	2	33	.09	4	0.3	0.5	26	KAO		
		3	1225	4.74	19	26.41	155	16.71	13.81	2.4	2.6	14	5	134	.14	2	2.2	0.8	1	DEP L		
		3	13	7	27.05	19	19.38	155	11.21	5.74	2.1	2.0	38	4	100	.10	6	0.4	0.8	23	SF3	
		3	1521	37.68	19	43.29	156	0.72	7.60	1.6	1.3	0	264	.08	19	3.0	0.9	4	HUA			
		4	113	4.76	19	21.59	155	1.76	7.13	1.9	1.9	42	5	167	.16	4	0.6	0.4	37	SF5		
		4	147	23.28	19	19.65	155	11.53	6.79	1.6	1.5	39	10	91	.12	5	0.3	0.6	30	SF3		
		4	632	59.40	19	20.27	155	12.00	8.13	1.6	1.2	28	5	77	.09	5	0.4	0.5	24	SF3		
		4	817	53.12	19	22.72	155	19.33	9.09	2.7	2.9	19	3	97	.10	2	0.5	0.8	16	KAO L		
		5	441	22.87	19	24.02	155	17.06	1.62	1.8	1.0	10	3	93	.06	2	0.3	0.5	8	SSC		
		5	1012	33.48	19	31.35	155	53.87	7.64	1.3	21	2	168	.18	4	1.5	0.6	20	KUN			
		5	16	5	16.98	19	23.29	155	17.37	6.17	2.1	2.0	16	4	88	.13	1	0.6	0.6	13	INT L	

YEAR	MON	DA	HR	MIN	SEC	LAT N	DEG	MIN	LON W	DEG	MIN	DEPTH	KM	AMP	DUR	GAP	RMS	MIN	ERR	ERZ	NO
1988	DEC	31	13	48	12.63	19	21.19	155	2.59	6.87	1.5	33	2	142	.12	2	0.7	0.8	32	SF5	
		31	14	57	40.75	19	17.53	155	12.98	8.56	2.2	40	6	131	.11	1	0.4	0.6	35	SF2	
		31	15	14	52.51	19	19.68	155	8.50	6.97	1.2	33	6	154	.13	5	0.5	0.7	30	SF4	
		31	15	15	21.26	19	19.69	155	8.22	7.95	1.2	36	9	86	.11	4	0.4	0.6	30	SF4	
		31	21	58	26.03	19	26.12	155	19.27	7.02	2.3	28	6	97	.10	3	0.4	0.6	23	KAO	

Table 6.

1988 HVO EARTHQUAKE SUMMARY LIST M23.0

YEAR	MON	DA	ORIGIN TIME		LAT N		LON W		DEPTH AMP DUR				GAP RMS MIN ERH				ERZ NO				
			HRMN	SEC	DEG	MIN	DEG	MIN	KM	MAG	MAG	NR	NS	DEG	SEC	DIS	KM	KM	FM	REMK	
1988	JAN	14	19	7	22.43	19	48.24	155	23.21	24.55	3.1	3.0	61	19	81	.12	8	0.4	0.9	36	KEA
		20	359	28.26	19	21.67	155	30.31	9.16	2.7	3.1	56	12	33	.13	5	0.3	0.5	44	KAO	
		22	7	4	18.91	19	22.99	154	43.88	46.45	3.8		66	19	287	.13	15	0.9	0.7	49	LER F
		26	1524	36.00	19	20.58	155	3.94	8.61	3.9	4.0	49	5	105	.11	2	0.5	0.4	43	SF5 F	
		30	1743	19.92	20	10.10	155	53.00	12.01	2.7	3.0	46	7	295	.08	41	0.4	0.4	41	KOH	
	FEB	7	749	3.56	19	9.87	155	41.10	7.66	2.9	3.0	53	16	127	.16	12	0.4	0.8	37	LSW	
		10	326	57.68	19	21.78	155	2.78	8.68	3.1	3.1	58	12	123	.10	4	0.4	0.4	40	SF5 F	
		12	1315	50.73	19	43.78	155	2.79	0.00	2.7	3.0	13	2	242	.30	5	5.9	3.8	9	HIL B*	
		14	1558	34.36	20	0.34	155	28.32	6.74	2.9	3.3	52	8	193	.12	25	0.4	0.7	47	KEA F	
		15	1435	7.19	19	26.78	155	15.88	13.44	2.6	3.4	23	9	166	.11	2	1.0	0.6	14	DEP L	
	16	229	46.79	19	25.35	155	13.72	12.51	2.8	3.3	23	10	202	.14	2	1.3	0.5	13	SF2 L		
	16	1410	38.31	19	25.70	155	18.47	14.22	2.9	3.0	16	5	102	.11	2	1.5	0.8	1	DEP L		
	17	130	1.77	19	25.48	155	15.74	12.99	2.7	3.2	19	8	142	.10	2	0.9	0.7	0	INT L		
	17	1313	26.59	19	31.89	155	18.18	12.30	2.9	3.1	12	3	298	.08	8	1.6	1.3	2	GLN L		
	18	251	59.21	19	22.32	155	15.31	14.96	2.6	3.0	14	5	234	.14	1	1.6	0.9	9	DEP L		
	18	859	40.58	19	22.63	155	18.18	4.27	2.8	3.1	15	4	81	.13	3	0.6	1.0	0	SSC L		
	18	916	12.66	19	26.38	155	16.02	25.49	2.9	3.1	18	9	189	.09	3	2.0	0.9	4	DEP L		
	18	14	0	20.88	19	27.66	155	14.57	12.65	2.7	3.1	15	4	250	.14	4	1.4	0.7	1	INT L	
	19	12	6	46.63	19	32.28	156	1.15	10.81	2.9	3.2	39	5	254	.14	12	0.9	0.4	17	KON F	
	19	1847	4.73	19	21.58	155	1.69	8.58	4.2	4.3	60	10	156	.11	4	0.5	0.4	48	SF5 F		
MAR	20	2235	52.66	20	5.92	156	12.85	41.64	3.7	3.9	56	15	200	.14	46	0.6	1.1	43	KOH		
	1	2241	56.36	19	19.70	155	12.49	10.37	5.2	4.6	56	8	81	.11	5	0.4	0.3	49	SF2 F		
	3	623	13.15	19	13.90	155	5.53	42.73	2.9	3.0	69	21	202	.13	8	0.8	0.4	49	DEP		
	3	12	4	57.63	19	47.19	156	12.98	12.07	3.0	3.3	33	7	274	.15	41	0.7	1.0	25	HUA	
	8	456	31.98	19	21.74	155	2.97	8.97	3.5	3.8	61	14	116	.10	3	0.3	0.3	43	SF5 F		
	9	423	29.25	19	23.23	155	16.15	11.44	2.6	3.1	24	4	63	.20	1	0.7	0.7	20	INT L		
	9	427	38.96	19	25.19	155	16.43	15.35	2.5	3.0	29	10	107	.15	1	1.0	0.6	19	DEP L		
	11	858	54.07	20	51.12	155	31.38	14.76	3.2	3.0	31	2	319	.12	85	7.0	10.6	29	DIS -		
	12	753	1.21	20	37.55	155	24.12	78.16	2.9	3.6	11	4	319	.11	68	2.8	2.5	7	DIS		
	12	1639	19.38	19	19.69	155	12.59	8.52	3.2	3.2	57	10	80	.13	5	0.3	0.3	49	SF2		
	13	528	48.05	19	21.38	155	1.94	6.94	3.2	3.4	54	9	153	.12	3	0.4	0.5	46	SF5		
	15	830	37.52	19	20.23	155	11.88	9.19	3.3	3.5	57	10	79	.12	5	0.4	0.3	46	SF3 F		
	16	1657	46.25	19	57.43	155	43.09	36.33	3.3	3.7	68	19	139	.11	12	0.5	0.7	50	KOH F		
	20	525	59.96	19	21.98	155	4.62	8.53	4.1	4.4	57	9	76	.11	4	0.4	0.3	49	SF5 F		
	24	711	18.99	19	20.40	155	11.72	10.10	2.9	3.1	59	14	77	.13	4	0.4	0.3	46	SF3 F		
	24	13	8	33.07	19	49.17	155	35.79	14.97	3.4	4.0	61	12	102	.10	8	0.5	0.4	47	KEA F	
	24	1429	52.15	19	57.01	156	24.58	2.64	5.0	5.2	56	5	226	.11	69	1.2	0.9	51	DIS F		
	24	1455	2.08	19	57.41	156	24.29	7.30	2.9	3.4	47	2	226	.12	73	1.1	2.1	39	DIS		
	24	1531	3.34	19	56.21	156	20.49	1.05	3.1	3.2	48	5	284	.12	59	2.2	0.7	38	DIS		
	25	147	42.60	19	54.48	156	27.83	53.94		3.6	24	2	292	.13	70	2.4	2.1	24	DIS		
	25	3	3	2.54	19	21.89	155	4.82	9.01	3.0	3.3	59	10	76	.11	5	0.5	0.4	49	SF5	
	25	441	44.89	20	0.03	156	25.30	30.82	3.0	3.4	37	1	311	.13	70	1.6	3.3	37	DIS		
	25	519	48.50	19	57.61	156	24.43	10.06	3.4	3.9	60	9	226	.14	67	0.9	1.3	52	DIS		
	25	715	44.74	19	22.57	155	28.86	10.26	2.7	3.1	57	8	35	.13	2	0.3	0.4	50	KAO		
	27	1733	41.59	19	56.57	156	24.70	2.79	5.2	5.6	56	10	227	.11	69	1.2	0.8	47	DIS F		

1988 HVO EARTHQUAKE SUMMARY LIST $M \geq 3.0$

YEAR	MON	DA	ORIGIN TIME		LAT N		LON W		DEPTH		AMP		DUR	GAP		RMS	MIN	ERH	ERZ NO	
			HRMN	SEC	DEG	MIN	DEG	MIN	KM	MAG	MAG	NR	NS	DEG	SEC	DIS	KM	KM	FM	REMK
1988	MAR	27	1746	2.27	19	36.25	155	46.97	64.56		3.1	20	4	100	.19	11	2.1	1.4	14	KON
		27	1752	7.53	19	59.07	156	29.65	30.53	2.3	3.3	36	4	327	.10	82	2.0	3.8	32	DIS
		27	1758	34.13	19	57.98	156	28.19	37.05	4.4	5.2	63	17	232	.14	73	0.6	1.4	46	DIS F
		27	18 3	12.03	19	55.44	156	27.71	29.87	1.8	3.1	33	4	232	.11	84	1.4	3.3	27	DIS
		27	18 6	33.12	19	54.95	156	22.21	6.09	2.0	3.6	43	6	223	.12	61	1.0	1.9	37	DIS
		27	1823	1.33	19	57.65	156	28.79	31.95	2.5	3.8	46	2	294	.13	74	1.3	2.5	44	DIS
		27	1829	32.79	19	56.89	156	26.96	3.60	3.1	3.6	49	6	230	.12	70	1.1	1.1	43	DIS
		27	1844	48.02	19	48.33	156	2.88	78.21		3.4	15	3	312	.19	26	6.1	1.3	12	HUA
		27	20 0	58.58	19	56.89	156	24.16	8.09	2.8	3.1	38	4	225	.10	68	0.9	1.6	23	DIS
		27	2011	10.84	19	58.58	156	23.79	32.29	3.3	4.2	48	5	224	.11	67	0.9	2.0	31	DIS
		27	2019	39.46	19	57.85	156	23.44	33.28	3.3		51	5	224	.12	66	1.0	2.0	44	DIS
		27	2132	40.15	19	57.50	156	25.19	6.72	3.9	4.3	63	16	227	.13	68	1.0	1.7	46	DIS
		28	028	18.69	19	57.63	156	26.13	29.31	2.9	3.6	43	3	310	.10	69	1.2	2.8	42	DIS
		28	121	6.56	19	57.27	156	27.47	31.03	3.7		52	7	231	.12	73	1.0	2.2	37	DIS
		28	221	38.55	19	58.39	156	24.00	5.00	3.1		52	9	225	.13	67	1.0	1.6	38	DIS
		28	9 1	3.82	19	58.65	156	24.52	32.49	3.1	3.5	49	7	226	.12	68	0.9	2.0	42	DIS
		28	9 3	16.89	19	52.14	156	22.71	51.19	2.7	3.6	29	5	284	.20	60	3.0	2.8	24	DIS
		28	1125	25.52	19	57.15	156	31.68	27.08	2.8	3.3	35	4	295	.13	78	1.3	4.3	31	DIS
		28	1235	57.35	20	1.72	156	41.15	37.72	3.2	4.2	34	2	316	.14	95	1.8	2.4	33	DIS
		28	1320	27.93	19	54.88	156	20.54	0.68	3.1	3.3	42	6	306	.11	58	2.0	0.6	21	DIS
		28	1553	51.21	19	59.81	156	30.34	30.66	3.0		48	2	297	.13	77	1.2	2.4	46	DIS
		28	1614	2.50	19	59.63	156	29.57	34.38	3.1	3.4	38	3	296	.14	76	1.6	2.6	36	DIS
		28	1720	35.99	19	58.07	156	28.00	32.02	3.2	4.1	50	2	232	.13	73	1.2	2.2	48	DIS
		29	0 8	21.88	19	58.35	156	23.97	29.61	3.8	4.3	55	9	225	.12	67	1.0	2.2	43	DIS
		29	1550	57.18	19	52.59	156	13.92	79.48		3.3	13	2	269	.11	46	3.1	1.1	12	HUA
		30	351	43.85	19	59.65	156	26.09	28.09	3.1	4.0	49	3	293	.11	70	1.2	2.9	46	DIS
		30	547	36.95	19	20.81	155	4.16	9.03	3.8	4.2	57	14	99	.12	3	0.4	0.3	44	SF5 F
		30	621	51.14	19	58.43	156	29.09	25.07	3.8	4.8	59	11	294	.12	75	1.1	3.4	48	DIS F
		30	9 6	49.21	19	47.26	156	10.14	17.65	2.8	3.3	26	2	290	.15	42	1.6	15.5	15	HUA -
		31	246	51.62	19	55.53	156	23.01	2.41	4.4	4.6	49	2	224	.10	67	0.9	1.1	47	DIS F
		31	1228	53.69	19	56.63	156	31.24	3.50	3.4		48	6	237	.12	77	1.5	1.1	42	DIS
		31	1447	4.60	19	44.45	156	26.22	51.21	3.2	4.1	36	5	295	.23	61	2.7	2.6	31	DIS
		31	2144	14.26	20	5.41	156	12.39	45.26	3.1	3.4	48	14	198	.20	45	0.8	1.3	37	KOH
APR		1	944	39.77	19	53.70	156	12.61	51.03	3.7	4.4	63	19	205	.11	45	0.6	1.0	44	HUA F
		1	1848	10.20	19	54.94	156	23.24	31.50	4.9	5.1	59	9	225	.12	68	1.0	2.0	50	DIS F
		1	2018	46.15	19	55.08	156	22.93	30.07	2.7	3.1	35	2	224	.11	67	1.3	3.5	33	DIS
		2	410	22.69	19	54.31	156	22.61	5.11	2.7	3.0	46	5	223	.13	61	1.2	1.2	40	DIS
		2	2047	47.47	19	55.12	156	26.39	32.71	3.0	3.9	50	6	289	.17	68	1.6	2.8	44	DIS
		4	1922	12.14	20	15.29	156	28.84	6.71	3.6	3.7	52	10	233	.19	62	0.8	1.2	50	DIS
		5	19 0	0.11	19	56.30	156	25.68	8.59	3.5	4.1	54	14	228	.12	71	1.0	1.6	36	DIS
		9	1746	17.79	19	57.00	156	23.93	30.81	4.0	4.8	48	1	225	.13	65	1.6	2.9	47	DIS
		10	421	14.86	19	21.65	155	5.09	9.15	3.6	3.7	62	14	83	.11	5	0.5	0.3	48	SF5 F
		11	110	55.26	19	16.77	155	23.61	0.00	2.3	3.2	62	14	103	.18	5	0.3	0.2	47	SWR *
		13	118	27.37	19	54.94	156	33.15	38.82	3.4	4.3	45	7	243	.15	79	1.3	1.9	40	DIS
		14	1153	17.60	19	54.16	156	20.13	0.22	3.2	3.8	51	4	281	.10	57	1.9	0.4	37	DIS

1988 HVO EARTHQUAKE SUMMARY LIST M>=3.0

		ORIGIN TIME		LAT N		LON W		DEPTH		AMP		DUR		GAP		RMS	MIN	ERH	ERZ NO	
YEAR	MON	DA	HRMN	SEC	DEG	MIN	DEG	MIN	KM	MAG	MAG	NR	NS	DEG	SEC	DIS	KM	KM	FM	REMK
1988	APR	15	758	45.92	19	59.75	156	28.98	11.71	3.3	3.7	51	5	233	.12	75	1.3	1.6	46	DIS
		15	1835	17.38	19	53.73	156	22.18	6.95	3.1	3.7	47	9	223	.12	65	1.1	1.7	39	DIS
		15	1841	21.70	19	53.86	156	22.37	7.24	3.0	3.4	42	6	223	.13	66	1.8	2.5	33	DIS
		15	2225	17.67	19	57.35	156	22.76	6.76	3.5	4.1	64	18	223	.12	64	0.8	1.0	48	DIS
		16	1152	8.90	19	55.81	156	22.77	3.79	2.7	3.2	40	3	224	.10	63	1.2	1.0	28	DIS
		17	2055	16.86	20	17.91	155	39.81	44.76	3.1	3.0	54	14	284	.13	22	0.6	0.4	45	KOH
		18	1939	41.98	18	55.45	155	23.77	26.44	3.2	3.4	63	17	240	.11	27	0.7	1.7	47	LOI
		20	739	42.20	19	50.29	155	44.56	11.03	2.8	3.4	29	1	231	.11	20	1.4	0.6	18	HUA
		20	859	59.38	19	59.98	156	24.31	4.26	2.9	3.1	50	4	225	.11	67	0.8	1.3	46	DIS
		20	1139	0.28	19	19.08	155	29.29	9.29	2.9	3.1	53	10	39	.13	7	0.3	0.5	43	KAO
		26	1123	11.72	19	58.99	156	28.59	6.62	3.1	3.4	55	9	233	.15	74	1.2	1.6	48	DIS
		28	2153	58.67	19	45.12	155	58.49	21.88	4.0	4.5	63	11	178	.13	16	0.6	1.3	53	HUA F
		30	1930	4.18	19	59.59	156	29.45	4.74	4.0	4.5	72	22	234	.11	76	0.9	1.1	50	DIS
	MAY	9	1428	7.92	19	58.22	156	23.87	6.01	3.7	4.3	54	7	224	.13	66	1.0	1.3	45	DIS
		11	1314	18.08	19	46.96	155	31.33	23.10	4.3	4.6	67	17	92	.10	7	0.4	0.9	50	KEA F
		11	1341	38.61	19	46.91	155	31.11	21.96	3.9	3.7	69	19	91	.11	6	0.3	0.8	51	KEA F
		22	1043	47.22	19	22.25	155	30.26	9.66	2.8	3.0	49	6	32	.10	5	0.3	0.6	38	KAO
		24	044	17.06	20	2.36	156	32.88	28.52	3.5	4.4	47	2	316	.12	84	1.5	2.9	46	DIS
		26	243	9.64	20	7.27	156	43.26	29.28	3.0	3.5	42	1	322	.12	109	2.7	3.4	38	DIS
		28	932	6.07	19	50.89	156	17.70	6.23	3.4	4.2	28	0	302	.13	51	6.0	2.4	15	HUA
		29	2246	50.99	19	56.61	156	27.40	7.94	3.3	3.5	30	2	310	.10	76	5.8	8.3	25	DIS
		30	2341	8.82	19	20.10	155	12.63	7.18	2.8	3.1	51	4	74	.15	5	0.4	0.6	40	SF2
		31	556	19.85	19	20.14	155	6.62	9.33	3.6	3.9	57	10	112	.10	6	0.4	0.3	49	SF4
	JUN	1	754	4.32	19	18.42	155	7.23	9.71	3.1	3.4	48	4	176	.13	8	0.7	0.5	40	SF4
		1	1252	19.91	20	3.47	155	48.61	25.04	3.0	3.4	50	13	197	.10	8	0.6	0.9	36	KOH
		2	11 2	16.36	19	56.37	156	25.09	31.45	3.2	4.1	48	3	289	.12	67	1.2	2.6	44	DIS
		6	18 3	36.37	20	48.88	155	26.93	12.90	4.0	4.7	55	5	311	.14	84	4.8	6.2	46	DIS
		6	2225	13.72	19	55.31	156	20.34	7.71	3.4	4.1	52	4	282	.12	58	2.2	2.4	48	DIS
		7	048	46.29	19	19.65	155	7.40	8.96	4.0	4.6	55	7	107	.10	4	0.4	0.3	51	SF4 F
		9	1523	18.98	19	34.11	156	25.00	34.12	3.2	3.8	51	7	278	.10	53	0.8	1.9	43	DIS
		10	1459	2.11	19	26.79	154	50.91	44.30	3.3	3.5	63	11	233	.10	1	0.7	0.5	49	LER
		15	028	35.33	20	38.95	155	25.52	1.52	2.9	3.1	33	4	310	.13	69	10.9	4.9	31	DIS -
		17	230	36.50	19	55.61	156	18.01	3.28	3.5	4.3	49	0	279	.11	55	2.9	2.4	39	KOH
		17	17 2	35.45	20	49.64	155	28.06	15.99	3.3	3.3	34	5	321	.14	84	5.0	15.5	27	DIS -
		18	2331	38.61	20	23.72	156	58.06	41.58	3.2	4.2	33	3	282	.13	85	1.6	2.5	15	DIS
		19	0 9	55.32	19	21.80	155	3.03	8.32	2.8	3.3	51	6	113	.10	4	0.5	0.3	30	SF5
		20	421	6.64	20	45.47	155	27.36	17.12	3.1	3.9	50	4	309	.16	78	1.1	18.1	46	DIS -
		20	1550	25.41	19	19.01	155	29.05	9.86	3.8	4.0	55	7	39	.11	7	0.3	0.4	48	LSW F
		22	017	52.54	20	7.58	156	0.59	12.26	2.2	3.1	30	0	277	.13	24	6.8	2.3	33	KOH
		22	826	24.21	19	48.51	156	8.95	7.91	2.9	3.3	37	4	262	.14	35	1.1	1.0	34	HUA
		22	2148	36.29	19	24.26	155	16.37	15.78	3.2	3.9	64	14	32	.12	1	0.4	0.3	48	DEP F
		26	247	10.51	18	57.07	155	22.63	39.93	3.0	3.1	58	10	233	.13	25	0.9	0.6	50	LOI
		27	1055	2.51	19	16.08	155	16.00	29.51	2.9	3.7	71	20	153	.13	5	0.5	0.4	50	DEP
		28	155	42.46	19	24.47	155	16.80	15.06	2.9	3.6	63	17	29	.12	1	0.4	0.2	45	DEP
		28	1139	13.72	19	56.81	155	16.49	11.13	2.9	3.1	45	4	205	.11	37	0.6	0.7	41	KEA F

1988 HVO EARTHQUAKE SUMMARY LIST M>=3.0

		ORIGIN TIME			LAT N		LON W		DEPTH AMP DUR				GAP RMS MIN			ERH		ERZ NO		
YEAR	MON	DA	HRMN	SEC	DEG	MIN	DEG	MIN	KM	MAG	MAG	NR	NS	DEG	SEC	DIS	KM	KM	FM	REMK
1988	JUL	3	1938	9.31	19	12.92	155	27.36	9.60	5.4	4.9	47	0	115	.14	6	0.6	0.5	52	LSW F
		10	1912	55.89	20	41.89	155	28.14	16.31	4.0	4.7	56	6	306	.18	71	3.1	17.4	50	DIS -
		11	1817	47.54	19	25.05	155	19.63	4.54	2.6	3.4	57	12	37	.14	3	0.3	0.5	47	KAO
		11	1818	19.31	19	24.00	155	21.13	8.22	2.4	3.0	23	6	52	.24	3	0.7	1.2	17	KAO
		11	1917	47.09	19	25.44	155	19.24	4.53	2.7	3.4	58	12	38	.14	3	0.3	0.5	45	KAO
		12	841	51.31	19	21.07	155	2.12	0.38	2.2	3.2	9	0	168	.10	3	1.0	1.5	3	SSF
		15	11 6	20.53	19	20.09	155	12.52	8.43	2.7	3.1	53	9	75	.13	5	0.4	0.5	48	SF2
		17	1725	47.50	19	15.48	155	16.16	31.35	4.3	4.5	54	3	158	.11	5	0.6	0.9	51	DEP F
		19	1112	21.72	19	19.45	155	13.66	8.94	2.8	3.2	56	7	64	.12	5	0.4	0.5	43	SF2
		22	353	6.67	17	23.33	154	59.76	7.30	3.8	3.9	60	11	334	.12	191	9.1	11.9	49	DIS -
		22	722	41.69	19	55.88	155	10.74	40.76	2.7	3.1	68	20	213	.13	18	0.5	0.7	49	KEA
		24	2053	26.45	20	24.18	155	59.16	11.07	2.7	3.3	30	7	314	.10	37	0.7	0.3	31	KOH
		26	23 0	53.70	19	13.29	155	28.68	9.48	3.5	4.1	66	17	90	.20	4	0.4	0.5	49	LSW
		29	7 6	34.18	19	56.57	156	28.08	33.44	3.5	4.0	54	11	232	.13	72	0.6	2.1	43	DIS
		31	3 7	14.20	18	50.97	155	11.43	10.46	2.8	3.6	41	7	265	.12	45	0.6	0.6	37	LOI
		31	358	42.20	18	52.75	155	11.84	12.65	3.8	4.5	53	10	260	.13	42	0.7	1.1	47	LOI
		31	4 4	33.59	18	58.55	155	13.28	14.18	4.2	4.8	50	6	271	.11	33	0.9	1.0	48	LOI
		31	450	47.03	18	58.67	155	12.64	16.93	3.9	4.6	51	5	236	.13	33	0.9	12.9	48	LOI -
		31	15 6	26.21	18	56.09	155	12.50	10.39	2.6	3.2	27	2	298	.13	37	1.9	0.7	9	LOI
AUG	2	240	1.21	19	19.67	155	10.38	8.63	2.4	3.0	52	9	93	.12	5	0.4	0.3	45	SF3	
		2	314	28.62	19	21.53	155	7.75	8.48	2.8	3.0	60	13	74	.12	3	0.4	0.3	49	SF4
		2	1055	7.94	19	14.08	155	29.20	8.88	2.7	3.4	50	8	134	.17	2	0.6	0.7	42	LSW F
		4	1658	50.00	19	19.92	155	23.25	31.60	3.4	3.8	60	11	74	.12	1	0.5	0.6	43	DEP
		4	17 5	54.44	19	19.83	155	23.09	31.86	2.3	3.3	64	19	77	.11	1	0.4	0.6	43	DEP
		5	19 2	1.60	19	24.96	155	16.22	14.77	3.0	3.5	26	5	73	.11	1	0.6	0.5	11	DEP L
		6	17 2	16.84	19	26.90	155	15.70	13.92	2.8	3.4	25	6	126	.15	4	0.9	0.8	18	DEP L
		6	1747	40.92	19	21.14	155	6.02	7.67	2.5	3.0	46	6	93	.12	5	0.5	0.6	39	SF4
		7	1155	31.97	19	57.14	156	25.79	8.99	3.0	3.3	47	5	228	.11	68	1.1	1.8	30	DIS
		12	2142	56.73	19	32.98	155	30.45	41.37	2.5	4.5	26	4	90	.17	5	1.4	1.2	22	DML L
		13	1620	47.45	20	12.26	156	30.07	8.73	4.5	4.6	52	6	235	.11	68	1.0	1.3	49	DIS
		13	1943	49.93	19	21.09	155	6.79	8.30	2.6	3.0	54	8	89	.13	4	0.5	0.4	46	SF4
		14	19 4	15.94	19	52.51	155	7.75	38.56	3.3	3.7	63	18	211	.12	18	0.6	0.9	43	KEA
		15	614	30.38	19	21.01	155	1.47	1.63	2.9	4.0	40	3	175	.21	3	0.7	1.1	37	SSF
		15	1154	8.05	19	23.52	155	13.97	1.32	2.4	3.0	28	4	71	.14	2	0.3	0.3	25	SER L
		16	843	59.39	19	27.40	155	14.96	5.91	2.4	3.0	23	6	193	.19	3	0.9	1.3	17	INT L
		16	2346	58.15	19	25.32	155	15.90	27.31	2.7	3.0	15	3	135	.14	2	2.0	1.0	14	DEP L
		17	614	40.15	20	3.55	156	7.47	46.20	2.6	3.1	21	2	288	.09	37	2.2	0.9	19	KOH
		20	555	20.82	19	20.45	155	11.79	9.24	3.4	3.9	53	9	75	.12	5	0.3	0.4	45	SF3
		25	010	27.94	19	21.36	155	14.83	9.94	3.3	3.4	57	13	64	.12	3	0.3	0.3	46	SF1
		25	1438	44.63	18	47.36	156	53.17	32.74	3.1	3.0	23	3	332	.10	119	2.1	3.6	11	DIS
		26	2315	51.94	19	29.81	155	54.30	9.55	2.9	3.5	40	2	134	.10	2	0.5	0.4	41	KON
		27	1250	35.62	19	30.66	155	16.76	22.57	2.9	3.0	59	10	60	.11	5	0.4	0.5	49	DEP
		30	930	19.41	19	19.95	155	11.99	7.88	2.7	3.2	61	13	82	.14	5	0.3	0.4	49	SF3 F
		31	0 9	53.78	19	21.02	155	2.26	0.76	2.1	3.1	8	2	165	.09	2	0.6	1.1	6	SSF
SEP	2	141	27.33	19	20.59	155	6.61	8.26	3.2	3.5	64	16	101	.12	5	0.3	0.3	48	SF4	

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		ORIGIN TIME		LAT N		LON W		DEPTH AMP DUR				GAP RMS MIN ERH				ERZ NO					
YEAR	MON	DA	HRMN	SEC	DEG	MIN	DEG	MIN	KM	MAG	MAG	NR	NS	DEG	SEC	DIS	KM	KM	FM	REMK	
1988	SEP	3	3	6	56.06	19	25.77	155	16.38	10.49	2.7	3.1	21	5	127	.09	2	0.8	0.7	16	INT L
		4	2337	13.47	19	24.86	155	17.30	13.63	2.5	3.0	18	3	70	.19	1	1.3	0.9	15	DEP L	
		6	918	1.14	19	21.25	155	1.86	9.40	3.8	4.0	26	4	173	.10	3	0.6	0.4	13	SF5 F	
		11	757	6.75	19	35.40	156	18.55	35.06	3.2	3.9	31	0	267	.10	42	2.1	1.6	31	KON	
		12	1952	40.43	19	18.76	155	28.97	10.04	4.1	4.2	51	2	41	.11	7	0.3	0.4	46	LSW F	
		13	1329	50.26	19	43.10	155	3.49	0.00	2.6	3.2	33	1	195	.16	3	1.3	0.6	32	HIL B*	
		15	710	52.37	19	1.20	155	6.79	47.09	2.7	3.2	58	9	237	.12	30	1.1	1.0	50	LOI	
		15	955	54.92	19	21.16	155	19.56	29.39	3.0	3.0	69	19	48	.12	4	0.5	0.4	51	DEP	
		16	1439	9.53	19	56.67	155	30.54	33.07	3.1		64	14	149	.10	18	0.5	1.0	48	KEA	
		19	2153	49.04	19	22.28	155	30.03	11.43	2.8	3.2	60	14	33	.09	4	0.3	0.3	47	KAO	
	20	18	0	17.50	19	16.30	156	2.72	38.92	2.9	3.3	61	16	261	.08	18	0.7	0.9	45	KON	
	22	1229	58.54	21	34.43	162	16.44	37.78	5.4		25	0	347	.366	29	32.3	6.0	27	DIS	-	
	24	953	35.22	19	24.32	155	15.88	6.74	2.8	3.0	23	7	88	.19	1	0.9	0.7	16	INT L		
	26	657	46.15	19	23.83	155	16.71	7.90	2.6	3.4	19	2	56	.14	0	0.5	0.7	18	INT L		
	27	928	17.05	19	24.33	155	16.76	11.07	2.7	3.3	12	1	80	.13	1	1.0	1.4	2	INT L		
	28	1728	59.28	19	27.97	155	15.80	8.73	2.7	3.0	14	3	257	.15	2	1.5	1.1	3	INT L		
	29	724	16.40	19	23.51	155	16.91	9.27	2.7	3.2	16	3	59	.10	0	0.8	0.9	14	INT L		
	29	1430	33.13	19	19.92	155	6.50	9.67	4.1	4.2	57	10	118	.11	5	0.5	0.3	48	SF4 F		
	30	1518	13.74	19	21.62	155	28.43	10.43	3.6	3.8	68	16	39	.13	2	0.3	0.4	51	KAO		
	OCT	2	18	6	43.16	19	45.15	155	20.43	31.45	4.1	4.5	38	2	97	.11	15	0.7	1.7	33	KEA F
3		5	8	27.22	19	28.59	155	24.10	14.53	3.1	3.9	62	12	26	.12	3	0.4	0.2	49	DML	
4		849	49.10	22	6.60	156	25.91	30.90	3.8	4.0	54	9	268	.12	185	0.8	1.5	46	DIS		
4		18	4	4.67	19	25.38	155	16.83	7.05	2.5	3.0	21	4	65	.18	1	0.6	0.5	1	INT L	
12		131	56.95	19	30.64	155	21.49	45.55	2.9	3.3	66	17	48	.13	4	0.5	0.5	50	DML		
12		448	0.19	21	8.06	156	15.93	35.07	2.1	3.4	32	6	335	.12	123	2.1	2.2	27	DIS		
14		937	31.68	19	12.82	155	19.15	53.18	2.1	3.5	23	3	227	.09	10	1.1	0.9	1	DEP L		
16		2040	46.63	19	20.87	155	3.90	7.66	2.8	3.1	50	7	92	.12	2	0.4	0.4	41	SF5 F		
20		848	57.93	19	21.33	155	18.66	30.20	2.9	3.6	67	21	44	.13	3	0.5	0.4	46	DEP		
23		735	15.63	19	12.37	155	27.23	9.66	2.7	3.1	49	13	118	.15	5	0.4	0.6	38	LSW F		
24	1531	12.03	19	49.52	154	55.56	7.04	2.8	3.0	14	2	324	.12	56	2.2	2.0	1	KEA			
27	457	39.95	19	24.70	155	16.82	14.78	2.7	3.0	19	3	88	.10	0	1.0	0.6	17	DEP L			
28	1620	4.61	19	11.93	155	33.15	9.55	3.8	4.1	56	14	168	.19	8	0.6	0.7	42	LSW F			
28	2028	11.84	20	9.80	154	45.74	6.49	3.5	3.5	49	9	279	.13	58	0.8	0.9	40	KEA			
NOV	1	440	12.31	19	21.77	155	28.27	10.01	3.2	3.7	66	18	39	.13	2	0.3	0.4	48	KAO F		
	10	1917	43.61	19	23.24	155	15.97	3.26	2.4	3.1	9	0	77	.13	2	0.6	0.8	1	SEC L		
	11	349	36.30	20	14.40	156	43.00	37.14	3.8	4.5	55	10	316	.13	99	0.8	1.8	46	DIS		
	15	940	16.68	19	23.54	155	16.96	7.80	2.6	3.0	20	5	54	.12	0	0.6	0.6	15	INT L		
	15	1546	17.41	19	23.76	155	15.99	14.68	2.9	3.2	12	5	69	.10	3	1.4	0.8	0	DEP L		
	16	910	29.00	19	22.88	155	16.86	8.51	2.7	3.4	18	1	48	.14	1	0.6	1.1	17	INT L		
	16	18	7	34.36	19	25.37	155	17.34	5.58	2.6	3.1	12	0	89	.11	1	0.9	1.1	0	INT L	
	16	1854	33.71	19	25.21	155	12.60	14.77	2.9	3.3	14	1	168	.26	3	2.2	2.8	0	DEP L		
	17	14	3	24.38	19	22.37	155	20.24	18.59	3.1	3.2	11	2	267	.22	3	3.9	1.9	0	DML L	
	17	2312	36.11	19	22.42	155	16.68	12.20	2.9	3.0	18	5	104	.15	1	1.0	0.6	14	INT L		
18	1855	27.13	19	26.16	155	12.92	17.31	2.9	3.2	14	2	280	.08	4	1.8	1.0	13	DEP L			
18	1920	5.47	19	21.81	155	30.02	9.67	2.5	3.0	45	3	39	.09	4	0.4	0.4	42	KAO			

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YEAR	MON	DA	HR	MIN	SEC	LAT N DEG MIN	LON W DEG MIN	DEPTH KM	AMP MAG	DUR MAG	NS	GAP DEG	RMS SEC	MIN DIS	ERH KM	ERZ NO KM FM	REMK
1988	NOV	18	20	7	31.09	19 27.64	155 14.42	7.30	2.6	3.1	19	3 212	.25	4	1.3	1.8 16	INT L
		19	3	3	3.15	19 24.77	155 16.04	12.16	2.8	3.4	18	3 104	.08	2	0.9	0.6 15	INT L
		19	11	35	56.52	19 24.63	155 16.73	9.78	2.8	3.1	17	2 88	.14	1	0.8	0.8 16	INT L
		19	15	3	4.79	19 27.30	155 25.77	6.41	2.8	3.1	51	7 46	.15	6	0.3	0.8 44	KAO
		19	18	29	4.54	19 23.41	155 16.25	23.91	3.1	3.4	17	2 59	.20	1	2.3	1.4 15	DEP L
		20	6	50	15.66	19 24.22	155 16.69	7.01	2.6	3.0	15	2 78	.13	1	0.8	0.6 14	INT L
		20	20	31	43.84	19 30.02	154 57.82	45.02	3.1	3.8	25	3 79	.14	6	1.3	2.2 13	LER
		21	6	13	52.21	19 38.25	156 6.86	37.10	2.9	3.3	48	6 244	.10	26	1.1	0.6 42	KON
		21	10	20	25.01	19 24.28	155 19.23	11.05	2.8	3.3	20	2 56	.12	1	0.5	0.8 20	KAO L
		26	2	23	27.85	19 24.21	155 17.01	13.00	2.7	3.0	20	5 75	.10	1	0.9	0.6 10	DEP L
		28	3	15	24.30	19 28.19	155 14.66	30.19	3.1	3.4	64	16 42	.12	4	0.4	0.4 48	DEP F
DEC		4	8	55	26.38	19 20.23	155 11.68	9.10	2.6	3.0	46	3 79	.13	5	0.4	0.5 38	SF3
		6	1	17	22.78	19 20.16	155 8.24	9.52	2.9	3.4	53	10 82	.10	5	0.3	0.3 47	SF4 F
		6	23	44	19.27	19 22.06	155 4.90	8.60	3.0	3.4	55	11 77	.10	4	0.5	0.4 45	SF5
		7	22	10	31.82	19 25.21	155 16.21	15.60	2.5	3.1	66	23 74	.10	1	0.4	0.2 45	DEP
		10	10	34	32.62	19 20.81	155 3.25	8.50	3.1	3.4	49	5 102	.10	2	0.4	0.3 45	SF5 F
		10	14	10	28.91	19 19.51	155 12.47	9.28	4.0	4.1	54	8 85	.11	5	0.3	0.4 45	SF2 F
		10	14	41	14.92	19 14.09	155 36.96	8.67	2.8	3.6	53	7 108	.19	2	0.5	0.8 46	LSW
		14	7	24	41.11	19 28.33	155 26.50	8.22	3.1	3.0	55	13 55	.12	6	0.3	0.5 45	KAO
		15	20	19	12.78	19 19.66	155 37.33	50.74		3.3	12	2 219	.10	9	2.4	1.3 10	DML
		21	15	2	59.62	19 23.80	155 35.36	13.55	3.4	3.8	56	12 51	.11	5	0.3	0.2 46	DML F
		23	12	33	33.88	19 19.13	155 13.24	10.78	3.7	4.2	53	6 127	.12	6	0.4	0.3 47	SF2 F
		23	12	35	30.47	19 18.65	155 13.46	9.26	3.1	3.2	49	7 133	.11	7	0.4	0.3 45	SF2
		23	17	39	57.81	19 18.17	155 13.15	9.27	2.8	3.2	53	12 96	.10	2	0.3	0.4 43	SF2
		27	3	18	8.22	19 44.50	155 30.14	14.79	3.1	3.5	45	7 144	.12	6	0.5	0.3 40	KEA
		30	4	25	42.69	19 21.19	155 7.20	8.56	2.9	3.4	45	4 84	.09	4	0.5	0.4 42	SF4