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

**National Earthquake Information Center
Waveform Catalog
February 1986**

by

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**This report is preliminary and has not been reviewed for conformity with
U.S. Geological Survey editorial standards.**

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Introduction

This report provides a visual catalog of digitally recorded waveform data available from the event tapes produced by the United States Geological Survey's National Earthquake Information Center (NEIC). It is intended to provide the researcher with a quick index both to the availability of data and to the character of the data for each event (e.g., complexity and directionality).

The network-event tapes are a data service initiated by the NEIC in 1984. Currently, these tapes contain data from the Global Digital Seismograph Network (GDSN), the Regional Seismograph Test Network (RSTN), and the Glen Almond, Canada, SRO station. In the future, data from other high-quality stations and arrays, installed and operated by countries around the world, will be added to the event tapes as they are made available to us.

Network-event tapes contain digital data for earthquakes of magnitude 5.5 or greater in the NEIC network-day tape format. For this catalog, all available vertical component recordings in all period bands are shown, including those for stations that were saturated or nonoperational or that had some other difficulty during the event. Horizontal component records were omitted in order to minimize the size of this catalog. In general, one can expect them to be of approximately the same quality as the vertical component records at any particular time. Most of the available stations do not record short-period horizontal components. All stations that have intermediate-period recordings, however, record all three components in this band. Only long-period components are recorded continuously; short- and intermediate-period channels are recorded only when an event is detected. Horizontal components (where available) are recorded whenever the vertical component is, and never otherwise.

This report mainly consists of vertical component waveforms from all reporting stations, organized by event. The section for each event is prefaced by a station coverage map, in which stations and geography within 100° of the source are shown in an azimuthal equidistant projection centered at the epicenter. Following the coverage map, all short-period, vertical component waveforms are shown in order of increasing epicentral distance. Each short-period waveform is two minutes long and is identified by station code, start

time, and epicentral distance, Δ , in degrees. The start time is chosen to be about 15 seconds before the earliest theoretical arrival time of interest (P, Pdiff, or PKPdiff, depending on distance). The vertical scale is in microns of ground displacement at the dominant period of the instrument response, which is taken to be 1 second. Each page of waveforms is titled with the event origin date-time, the Flinn-Engdahl region name, and the component identifier (SPZ, LPZ or IPZ). Also, the depth of the event (h) in kilometers and its average body (m_b) and vertical surface wave (M_{SZ}) magnitudes are shown for convenience.

Following the short-period waveforms (SPZ), long-period vertical (LPZ) and finally intermediate-period vertical (IPZ) waveforms are shown. In each case, the format is the same as for the short-period waveforms. Fifty minutes of long-period data are shown beginning 1 minute before the theoretical first arrival, and the dominant period is taken to be 25 seconds. Four minutes of intermediate-period data are shown beginning 30 seconds before the theoretical first arrival, and the dominant period is assumed to be 1 second. Because (1) the event detection algorithm is not perfect, (2) only about half of the available stations have intermediate-period channels, and (3) one station (GAC) has no short-period recordings, it is not uncommon for stations with good long-period recordings to have no intermediate-period and perhaps no short-period recordings at all.

With the inclusion of the Network of Autonomously Registering Stations (NARS) in September 1985, it was difficult to list the name of each station in the network on the station coverage map because of their close proximity. Instead, a new symbol ($\square$) will be used to denote each station of the network, with the name NARS. When other networks are included with stations situated close together, a new symbol will be used to denote each station of each network. The name used will be the network name only.

Table 1. Earthquakes for February 1986 with magnitudes ≥ 5.5

	Origin Time UTC	Latitude	Longitude	Depth (km)	Magnitude m_b	Magnitude M_{sz}	Flinn-Engdahl Region Name
1.	1986 02 02 01:44:10.26	13.618° S	166.612° E	70.6	5.7		Vanuatu Islands
2.	1986 02 03 20:47:35.89	27.889° N	139.402° E	515.7	5.7		Bonin Islands Region
3.	1986 02 10 09:51:16.74	21.575° S	170.285° E	134.5	5.6		Loyalty Islands Region
4.	1986 02 10 18:33:46.73	39.521° N	143.186° E	33.0	5.5	5.9	Off East Coast of Honshu, Japan
5.	1986 02 10 23:57:51.34	5.396° S	146.942° E	177.8	5.5		East Papua New Guinea Region
6.	1986 02 12 02:59:31.85	36.352° N	140.932° E	44.0	6.0	5.8	Near East Coast of Honshu, Japan
7.	1986 02 12 09:01:10.25	6.592° S	147.338° E	42.5	5.7	5.7	East Papua New Guinea Region
8.	1986 02 12 11:27:45.94	6.553° S	147.388° E	37.6	5.5	5.5	East Papua New Guinea Region
9.	1986 02 13 00:24:47.32	13.356° S	166.609° E	33.0	5.8	5.3	Vanuatu Islands
10.	1986 02 13 19:08:20.43	14.294° S	167.344° E	206.3	5.7		Vanuatu Islands
11.	1986 02 15 21:49:55.79	28.310° N	140.308° E	33.0	5.6		Bonin Islands Region
12.	1986 02 19 11:40:26.90	18.941° N	121.316° E	72.2	5.6		Luzon, Philippine Islands
13.	1986 02 20 09:16:02.43	21.148° S	70.109° W	33.0	5.7	4.9	Near Coast of Northern Chile
14.	1986 02 20 12:16:41.85	22.014° S	179.638° W	600.8	5.6		South of Fiji Islands
15.	1986 02 23 18:28:52.20	14.435° S	166.719° E	33.0	5.5	5.0	Vanuatu Islands
16.	1986 02 24 00:19:41.15	16.906° S	174.285° E	10.0	5.7	5.5	Fiji Islands Region
17.	1986 02 24 19:41:51.09	8.890° S	156.556° E	33.0	5.7	6.0	Solomon Islands

Table 2. Network-event tape station list for February 1986.

Code	ID	Station	Latitude	Longitude	Elevation (m)	Type*
ANMO	30	Albuquerque, New Mexico	34.95° N	106.46° W	1740.0	SRO
ANTO	31	Ankara, Turkey	39.87° N	32.79° E	883.0	SRO
BCAO	37	Bangui, Central African Republic	4.43° N	18.54° E	336.0	SRO
CHTO	33	Chiang Mai, Thailand	18.79° N	98.98° E	316.0	SRO
COL	62	College, Alaska	64.90° N	147.79° W	320.0	DWWSSN
CTAO	50	Charters Towers, Australia	20.09° S	146.25° E	357.0	ASRO
GAC	43	Glen Almond, Quebec, Canada	45.70° N	75.48° W	620.0	SRO
GDH	70	Godhavn, Greenland	69.25° N	53.53° W	23.0	DWWSSN
GRA1	302	Haidhof, Germany	49.69° N	11.22° E	500.0	GRF
GRFO	39	Graefenberg, Germany	49.69° N	11.22° E	500.0	SRO
GUMO	35	Guam, Mariana Islands	13.59° N	144.87° E	14.0	SRO
HON	66	Honolulu, Hawaii	21.32° N	158.01° W	2.0	DWWSSN
JAS1	64	Jamestown, California	37.93° N	120.42° W	425.0	DWWSSN
KEV	67	Kevo, Finland	69.76° N	27.01° E	80.0	DWWSSN
KONO	54	Kongsberg, Norway	59.65° N	9.60° E	216.0	ASRO
LON	63	Longmire, Washington	46.75° N	121.81° W	854.0	DWWSSN
MAJO	53	Matsushiro, Japan	36.54° N	138.21° E	422.0	ASRO
NRA0	301	NORESS array site A0	60.735° N	11.541° E	302.0	NRSA
NWAO	38	Mundaring (Narrogin), Australia	32.93° S	117.24° E	265.0	SRO
RSCP	81	Cumberland Plateau, Tennessee,	35.60° N	85.57° W	481.0	RSTN
RSNT	82	Yellowknife, Northwest Territories	62.48° N	114.59° W	90.0	RSTN
RSNY	84	Adirondack, New York	44.55° N	74.53° W	351.0	RSTN
RSON	85	Red Lake, Ontario	50.86° N	93.70° W	302.0	RSTN
RSSD	83	Black Hills, South Dakota	44.12° N	104.04° W	1948.0	RSTN
SCP	61	State College, Pennsylvania	40.79° N	77.87° W	352.0	DWWSSN
SLR	71	Silverton, South Africa	25.73° S	28.28° E	1348.0	DWWSSN
SNZO	42	Wellington (South Karori), New Zealand	41.31° S	174.70° E	-12.0	SRO
TATO	41	Taipei, Taiwan	24.98° N	121.49° E	53.0	SRO
TOL	73	Toledo, Spain	39.88° N	4.05° W	480.0	DWWSSN
ZOBO	51	La Paz (Zongo), Bolivia	16.27° S	68.13° W	4450.0	ASRO

- * ASRO - Abbreviated Seismic Research Observatory
DWWSSN - Digital World Wide Standardized Seismograph Network
GRF - Graefenberg Array
NARS - Network of Autonomously Registrating Stations
NRSA - Norwegian Regional Seismic Array
RSTN - Regional Seismic Test Network
SRO - Seismic Research Observatory

EARTHQUAKES – February 1986 – MAGNITUDE ≥ 5.5

02 February 1986 01:44:10.26

Vanuatu Islands

SPZ

02 February 1986 01:44:10.26
Vanuatu Islands $h=70.6$ $m_b=5.7$

SPZ

SPZ

02 February 1986 01:44:10.26
Vanuatu Islands $h=70.6$ $m_b=5.7$

SPZ

LPZ

02 February 1986 01:44:10.26
Vanuatu Islands $h=70.6$ $m_b=5.7$

LPZ

LPZ

02 February 1986 01:44:10.26
Vanuatu Islands $h=70.6$ $m_b=5.7$

LPZ

LPZ

02 February 1986 01:44:10.26
Vanuatu Islands $h=70.6$ $m_b=5.7$

LPZ

03 February 1986 20:47:35.89

Bonin Islands Region

SPZ

03 February 1986 20:47:35.89
Bonin Islands Region $h=515.7$ $m_b=5.7$

SPZ

SPZ

03 February 1986 20:47:35.89
Bonin Islands Region $h=515.7$ $m_b=5.7$

SPZ

SPZ

03 February 1986 20:47:35.89
Bonin Islands Region $h=515.7$ $m_b=5.7$

SPZ

LPZ

03 February 1986 20:47:35.89
Bonin Islands Region $h=515.7$ $m_b=5.7$

LPZ

LPZ

03 February 1986 20:47:35.89
Bonin Islands Region $h=515.7$ $m_b=5.7$

LPZ

LPZ

03 February 1986 20:47:35.89
Bonin Islands Region $h=515.7$ $m_b=5.7$

LPZ

10 February 1986 09:51:16.74

Loyalty Islands Region

SPZ

10 February 1986 09:51:16.74
Loyalty Islands Region $h=134.5$ $m_b=5.6$

SPZ

SPZ

10 February 1986 09:51:16.74

SPZ

Loyalty Islands Region $h=134.5$ $m_b=5.6$

Loyalty Islands Region $h=134.5$ $m_b=5.6$

LPZ

10 February 1986 09:51:16.74
Loyalty Islands Region $h=134.5$ $m_b=5.6$

LPZ

LPZ

10 February 1986 09:51:16.74

LPZ

Loyalty Islands Region $h=134.5$ $m_b=5.6$

10 February 1986 18:33:46.73

Off East Coast of Honshu, Japan

SPZ

10 February 1986 18:33:46.73

SPZ

Off East Coast of Honshu, Japan $h=33.0$ $m_b=5.5$ $M_{sz}=5.9$

SPZ 10 February 1986 18:33:46.73 SPZ
Off East Coast of Honshu, Japan $h=33.0$ $m_b=5.5$ $M_{sz}=5.9$

LPZ

10 February 1986 18:33:46.73

LPZ

Off East Coast of Honshu, Japan $h=33.0$ $m_b=5.5$ $M_{SZ}=5.9$

Off East Coast of Honshu, Japan $h=33.0$ $m_b=5.5$ $M_{sz}=5.9$

IPZ

10 February 1986 18:33:46.73

IPZ

Off East Coast of Honshu, Japan $h=33.0$ $m_b=5.5$ $M_{sz}=5.9$

10 February 1986 23:57:51.34

East Papua New Guinea Region

SPZ

10 February 1986 23:57:51.34

SPZ

East Papua New Guinea Region $h=177.8$ $m_b=5.5$

LPZ

10 February 1986 23:57:51.34

LPZ

East Papua New Guinea Region $h=177.8$ $m_b=5.5$

LPZ

10 February 1986 23:57:51.34

LPZ

East Papua New Guinea Region $h=177.8$ $m_b=5.5$

12 February 1986 02:59:31.85

Near East Coast of Honshu, Japan

Near East Coast of Honshu, Japan $h=44.0$ $m_b=6.0$ $M_{sz}=5.8$

LPZ

12 February 1986 02:59:31.85

LPZ

Near East Coast of Honshu, Japan $h=44.0$ $m_b=6.0$ $M_{SZ}=5.8$

LPZ

12 February 1986 02:59:31.85

LPZ

Near East Coast of Honshu, Japan $h=44.0$ $m_b=6.0$ $M_{sz}=5.8$

IPZ 12 February 1986 02:59:31.85 IPZ
Near East Coast of Honshu, Japan $h=44.0$ $m_b=6.0$ $M_{sz}=5.8$

12 February 1986 09:01:10.25

East Papua New Guinea Region

East Papua New Guinea Region $h=42.5$ $m_b=5.7$ $M_{SZ}=5.7$

SPZ

12 February 1986 09:01:10.25

SPZ

East Papua New Guinea Region $h=42.5$ $m_b=5.7$ $M_{sz}=5.7$

LPZ

12 February 1986 09:01:10.25

LPZ

East Papua New Guinea Region $h=42.5$ $m_b=5.7$ $M_{sz}=5.7$

East Papua New Guinea Region $h=42.5$ $m_b=5.7$ $M_{sz}=5.7$

12 February 1986 11:27:45.94

East Papua New Guinea Region

SPZ

12 February 1986 11:27:45.94

SPZ

East Papua New Guinea Region $h=37.6$ $m_b=5.5$ $M_{sz}=5.5$

LPZ

12 February 1986 11:27:45.94

LPZ

East Papua New Guinea Region $h=37.6$ $m_b=5.5$ $M_{sz}=5.5$

LPZ

12 February 1986 11:27:45.94

LPZ

East Papua New Guinea Region $h=37.6$ $m_b=5.5$ $M_{sz}=5.5$

13 February 1986 00:24:47.32

Vanuatu Islands

SPZ

13 February 1986 00:24:47.32

SPZ

Vanuatu Islands $h=33.0$ $m_b=5.8$ $M_{sz}=5.3$

LPZ

13 February 1986 00:24:47.32
Vanuatu Islands $h=33.0$ $m_b=5.8$ $M_{sz}=5.3$

LPZ

LPZ

13 February 1986 00:24:47.32
Vanuatu Islands $h=33.0$ $m_b=5.8$ $M_{sz}=5.3$

LPZ

LPZ

13 February 1986 00:24:47.32
Vanuatu Islands $h=33.0$ $m_b=5.8$ $M_{sz}=5.3$

LPZ

13 February 1986 19:08:20.43

Vanuatu Islands

SPZ

13 February 1986 19:08:20.43
Vanuatu Islands $h=206.3$ $m_b=5.7$

SPZ

SPZ

13 February 1986 19:08:20.43
Vanuatu Islands $h=206.3$ $m_b=5.7$

SPZ

LPZ

13 February 1986 19:08:20.43
Vanuatu Islands $h=206.3$ $m_b=5.7$

LPZ

LPZ

13 February 1986 19:08:20.43
Vanuatu Islands $h=206.3$ $m_b=5.7$

LPZ

LPZ

13 February 1986 19:08:20.43
Vanuatu Islands $h=206.3$ $m_b=5.7$

LPZ

15 February 1986 21:49:55.79

Bonin Islands Region

SPZ

15 February 1986 21:49:55.79

SPZ

Bonin Islands Region $h=33.0$ $m_b=5.6$

LPZ

15 February 1986 21:49:55.79
Bonin Islands Region $h=33.0$ $m_b=5.6$

LPZ

LPZ

15 February 1986 21:49:55.79
Bonin Islands Region $h=33.0$ $m_b=5.6$

LPZ

LPZ

15 February 1986 21:49:55.79
Bonin Islands Region $h=33.0$ $m_b=5.6$

LPZ

19 February 1986 11:40:26.90

Luzon, Philippine Islands

SPZ

19 February 1986 11:40:26.90

SPZ

Luzon, Philippine Islands $h=72.2$ $m_b=5.6$

SPZ

19 February 1986 11:40:26.90

SPZ

Luzon, Philippine Islands $h=72.2$ $m_b=5.6$

LPZ

19 February 1986 11:40:26.90
Luzon, Philippine Islands $h=72.2$ $m_b=5.6$

LPZ

LPZ

19 February 1986 11:40:26.90
Luzon, Philippine Islands $h=72.2$ $m_b=5.6$

LPZ

LPZ

19 February 1986 11:40:26.90

LPZ

Luzon, Philippine Islands $h=72.2$ $m_b=5.6$

20 February 1986 09:16:02.43

Near Coast of Northern Chile

SPZ

20 February 1986 09:16:02.43

SPZ

Near Coast of Northern Chile $h=33.0$ $m_b=5.7$ $M_{sz}=4.9$

SPZ

20 February 1986 09:16:02.43

SPZ

Near Coast of Northern Chile $h=33.0$ $m_b=5.7$ $M_{sz}=4.9$

LPZ

20 February 1986 09:16:02.43

LPZ

Near Coast of Northern Chile $h=33.0$ $m_b=5.7$ $M_{sz}=4.9$

LPZ

20 February 1986 09:16:02.43

LPZ

Near Coast of Northern Chile $h=33.0$ $m_b=5.7$ $M_{sz}=4.9$

Near Coast of Northern Chile $h=33.0$ $m_b=5.7$ $M_{sz}=4.9$

20 February 1986 12:16:41.85

South of Fiji Islands

SPZ

20 February 1986 12:16:41.85
South of Fiji Islands $h=600.8$ $m_b=5.6$

SPZ

SPZ

20 February 1986 12:16:41.85
South of Fiji Islands $h=600.8$ $m_b=5.6$

SPZ

LPZ

20 February 1986 12:16:41.85
South of Fiji Islands $h=600.8$ $m_b=5.6$

LPZ

LPZ

20 February 1986 12:16:41.85
South of Fiji Islands $h=600.8$ $m_b=5.6$

LPZ

23 February 1986 18:28:52.20

Vanuatu Islands

SPZ

23 February 1986 18:28:52.20
Vanuatu Islands $h=33.0$ $m_b=5.5$ $M_{SZ}=5.0$

SPZ

SPZ

23 February 1986 18:28:52.20

SPZ

Vanuatu Islands $h=33.0$ $m_b=5.5$ $M_{sz}=5.0$

LPZ

23 February 1986 18:28:52.20
Vanuatu Islands $h=33.0$ $m_b=5.5$ $M_{sz}=5.0$

LPZ

LPZ

23 February 1986 18:28:52.20
Vanuatu Islands $h=33.0$ $m_b=5.5$ $M_{sz}=5.0$

LPZ

LPZ

23 February 1986 18:28:52.20
Vanuatu Islands $h=33.0$ $m_b=5.5$ $M_{sz}=5.0$

LPZ

24 February 1986 00:19:41.15

Fiji Islands Region

SPZ

24 February 1986 00:19:41.15

SPZ

Fiji Islands Region $h=10.0$ $m_b=5.7$ $M_{sz}=5.5$

SPZ

24 February 1986 00:19:41.15

SPZ

Fiji Islands Region $h=10.0$ $m_b=5.7$ $M_{sz}=5.5$

LPZ

24 February 1986 00:19:41.15
Fiji Islands Region $h=10.0$ $m_b=5.7$ $M_{sz}=5.5$

LPZ

LPZ

24 February 1986 00:19:41.15

LPZ

Fiji Islands Region $h=10.0$ $m_b=5.7$ $M_{sz}=5.5$

Time (min)

LPZ

24 February 1986 00:19:41.15

LPZ

Fiji Islands Region $h=10.0$ $m_b=5.7$ $M_{sz}=5.5$

24 February 1986 19:41:51.09

Solomon Islands

SPZ

24 February 1986 19:41:51.09
Solomon Islands $h=33.0$ $m_b=5.7$ $M_{sz}=6.0$

SPZ

SPZ

24 February 1986 19:41:51.09

SPZ

Solomon Islands $h=33.0$ $m_b=5.7$ $M_{sz}=6.0$

LPZ

24 February 1986 19:41:51.09
Solomon Islands $h=33.0$ $m_b=5.7$ $M_{SZ}=6.0$

LPZ

LPZ

24 February 1986 19:41:51.09

LPZ

Solomon Islands $h=33.0$ $m_b=5.7$ $M_{sz}=6.0$

Solomon Islands $h=33.0$ $m_b=5.7$ $M_{sz}=6.0$

IPZ

24 February 1986 19:41:51.09

IPZ

Solomon Islands $h=33.0$ $m_b=5.7$ $M_{SZ}=6.0$