R. E. OWEN, GOVERNMENT PRINTER
WELLINGTON, NEW ZEALAND—1960

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New Zealand Department of Scientific and Industrial Research
GEOPHYSICS DIVISION

NEW ZEALAND

SEISMOLOGICAL REPORT 1956

SEISMOLOGICAL OBSERVATORY BULLETIN
E-137

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ALL measurement and interpretation of records is carried out at the central station in Wellington. Communications should therefore be addressed to:

The Superintendent,
Seismological Observatory,
P.O. Box 8005,
Wellington, New Zealand.

NEW ZEALAND SEISMOLOGICAL REPORT 1956

CONTENTS

INTRODUCTION

The New Zealand Seismological Report for 1956 introduces a number of changes in the manner of publishing earthquake data recorded in New Zealand. Hitherto, the Seismological Observatory has issued three series of bulletins. The P-series, which appeared in cyclostyled form only, gave P and S phases of well-recorded earthquakes, and a list of epicentres of shocks originating within 10° of Wellington. This was occasionally supplemented with felt data or further phase readings for very important shocks. The E-series gave more complete and revised phase readings for the distant earthquakes only, although local shocks reaching magnitude 5 were included. Printing difficulties resulted in the E-bulletin being at times an annual and at times a quarterly. The S-series consisted mainly of reprints of papers by staff members. Occasionally however, lists of N.Z. epicentres, maps, and annual reports of N.Z. seismicity were also included in the S-series.

With the development of faster communications and the improved organisation of world data and epicentre services, it is considered that the P-bulletin no longer serves a useful purpose, and the series will be discontinued. The E-bulletin is now designed to give an annual summary of all seismological work of a routine kind carried out by the Observatory; and will contain sufficient descriptive matter to make it of some use and interest to people other than professional seismologists. The S-series will now consist of reprints and material which is not of a routine character.

The plan of the bulletin should be apparent from the table of contents, and further explanations will be found at the head of

each section. Material for 1955 is still not fully interpreted, but it has been decided not to delay the issue of later readings which are now complete. It is hoped that organisational rearrangements at the Observatory will enable future E-bulletins to appear in the first half of each succeeding year.

STATIONS OF THE NEW ZEALAND NETWORK

The network of stations under the control of the Seismological Observatory, Wellington, may be considered to consist of two sections: first, a set of short-period instruments distributed widely over the country, and intended to yield records of earthquakes originating within New Zealand; and secondly, teleseismic instruments to provide information about distant earthquakes and the physical condition of the earth. These functions interlock, and every seismograph gives some useful information in both fields.

Many stations are in isolated parts of the country, and staff is not always available to remedy defects. However, it is reasonable to claim that even with an exceptionally unfavourable combination of station faults, no earthquake of sufficient strength to cause even minor damage is now likely to escape detection. Day-to-day operation of the station is in the hands of a number of other government departments, private organisations, and individuals. Without their willing help, the Observatory would be unable to maintain coverage of local activity. Teleseismic instruments were in operation at Suva, Auckland, Wellington, and Christchurch.

Not all of the stations listed below were in operation for the whole year, owing to a variety of mechanical faults and staffing difficulties. Increasing growth of the city impaired the efficiency of the Christchurch station, and towards the end of the year the instruments were dismantled. The Wood-Anderson seismometer was moved to a quiet site at Gebbies Pass on Banks Peninsula in mid-November, and the Galitzins to Roxburgh early in 1957. The longest gaps in recording are at Suva, during much of August; and at Tuai, where operation was intermittent from October to December, owing to failure of the motor in a new recorder installed in May. The Jaggar shock recorder at Monowai did not operate in July and August, as the clockwork was removed for overhaul. New Plymouth suffered from intermittent recorder and timing troubles throughout the year, and so did Tongariro.

Instrumental constants, standard abbreviations of the station names (used in the tabular sections of this report), geographical positions and similar information are listed below in order of increasing southern latitude.

SUVA (SU)

Latitude:	18°09' S
Longitude:	178°27' E
Height above mean sea level:	6.1 metres, 20 ft.

Geocentric direction cosines: a. - 0.950 515
b. + 0.025 720
c. - 0.309 613

Lithological Foundation: Hard, fine-grained, calcareous marl

Instrument	Component	Period	Damping	Magnification	Date
Milne-Shaw	N	12 sec	20:1	250	12/5

ONERAHI (ON)

Latitude: 35°46'.5 S

Longitude: 174°21'.7 E

Height above mean sea level: 33.5 metres, 110 ft.

Geocentric direction cosines: a. - 0.809 234
b. + 0.079 892
c. - 0.582 028

Lithological Foundation: Basalt

Instrument	Component	Period	Damping	Magnification	Dat
Wood-Anderson	E	1.1 sec critical		2800	8/

AUCKLAND (AK)

Latitude: 36°51'.7 S

Longitude: 174°46'.7 E

Height above mean sea level: 76.2 metres, 250 ft.

Geocentric direction cosines: a. - 0.798 694
b. + 0.072 992
c. - 0.597 293

Lithological Foundation: Volcanic beds on Tertiary sandsto and mudstone.

Instrument	Component	Period	Damping	Magnification	Dat
Milne-Shaw	N	10 sec	20:1	150	7/

KARAPIRO (KP)

Latitude: 37°55'.6 S

Longitude: 175°32'.3 E

Height above mean sea level: 61.0 metres, 200 ft

Geocentric direction cosines: a. - 0.788 405
b. + 0.061 519
c. - 0.612 072

Lithological Foundation: Greywacke

Instrument	Component	Period	Damping	Magnification	Dat
Wood-Anderson	N	0.8 sec critical		2800	7/

TUAI (TU)

Latitude: 38°48'.4 S

Longitude: 177°09'.1E

Height above mean sea level: 292.6 metres, 960 ft.

Geocentric direction cosines: a. - 0.780 359
b. + 0.038 825
c. - 0.624 126

Lithological Foundation: Thick Tertiary sandstone and mudstone.

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	N	0.8 sec critical		1400	7/57

NEW PLYMOUTH (NP)

Latitude: 39°04'.0 S

Longitude: 174°04'.4 E

Height above mean sea level: 34.1 metres, 112 ft.

Geocentric direction cosines: a. - 0.774 317
b. + 0.080 472
c. - 0.627 660

Lithological Foundation: Volcanic ash on thick Tertiary sandstone and mudstone.

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	E	0.8 sec critical		1400	5/55

TONGARIRO (TO)

Latitude: 39°12'.2 S

Longitude: 175°32'.3 E

Height above mean sea level: 1130.8 metres, 3710 ft

Geocentric direction cosines: a. - 0.774 637
b. + 0.060 444
c. - 0.629 512

Lithological Foundation: Volcanic ash and lava on Tertiary sandstone and mudstone.

Instrument	Component	Period	Damping	Magnification	Date
Jones	Z	0.5 sec	10:1	11,000	9/54

BUNNYTHORPE (BT)

Latitude: 40°17'.0 S

Longitude: 175°38'.1 E

Height above mean sea level: 60.0 metres, 197 ft.

Geocentric direction cosines: a. - 0.762 783
b. + 0.058 224
c. - 0.644 028

Lithological Foundation: Gravels, silts and sands.

Instrument	Component	Period	Damping	Magnification	Date
Imamura	NE (x)	8 sec		2	4/55
	NW (Y)	8		2	
	Z	2		2	

COBB RIVER (CB)

Latitude: 41°05'.2 S

Longitude: 172°44'.0 E

Height above mean sea level: 213.4 metres, 700 ft.

Geocentric direction cosines: a. - 0.749 836
b. + 0.095 613
c. - 0.654 679

Lithological Foundation: Schist.

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	E	0.8 sec	critical	2,800	5/53

WELLINGTON (WN)

Latitude: 41°17'.2 S

Longitude: 174°46'.0 E

Height above mean sea level: 122.2 metres, 401 ft

Geocentric direction cosines: a. - 0.750 478
b. + 0.068 739
c. - 0.657 311

Lithological Foundation: Greywacke

Instrument	Component	Period	Damping	Magnification	Date
Milne-Shaw	N	12 sec	30:1	250	3/53
Galitzin-Wilip	Z	To = 10.6 Tg = 10	critical	615	
Wood-Anderson	n	0.8	critical	2,800	8/53

The station has also Wenner and Imamura strong-motion instruments.

KAIMATA (KM)

Latitude: 42°31'.4 S

Longitude: 171°24'.6 E

Height above mean sea level: 70.1 metres, 230 ft.

Geocentric direction cosines: a. - 0.730 977
b. + 0.110 420
c. - 0.673 410

Lithological Foundation: Moraine and alluvium over Tertiary sandstone and mudstone.

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	NE (X)	0.8 sec	critical	2,800	5/53

CHRISTCHURCH (CH)

Latitude: 43°31'.9 S

Longitude: 172°37'.3 S

Height above mean sea level: 7.6 metres, 25 ft.

Geocentric direction cosines: a. - 0.721 288
b. + 0.093 401
c. - 0.686 309

Lithological Foundation: Alluvial sands, silts and gravels.

Instrument	Component	Period	Damping	Magnification	Date
Galitzin	N	To=Tg=24 sec	critical	267	11/56
	E	To=Tg=24	critical	275	
	Z	To=Tg=13	critical	465	
Wood-Anderson	NW (Y)	0.8	critical	1400	

GEBBIES PASS (GP)

Latitude: 43°41'.7 S

Longitude: 172°38'.8 E

Height above mean sea level: 225.5 metres, 740 ft.

Geocentric direction cosines: a. - 0.719 385
b. + 0.092 835
c. - 0.688 380

Lithological foundation: Rhyolite

Instrument	Component	Period	Damping	Magnification	Date
Wood-Anderson	N	0.8 sec	critical	2,800	11/56

MONOWAI (MN)

Latitude: 45°47' S

Longitude: 167°37' E

Height above mean sea level: 164.0 metres, 538 ft.

Lithological Foundation: Tertiary sandstone.

Instrument: Jaggar shock-recorder

TIMING ARRANGEMENTS

Radio time signals originating in the Seismological Observato Wellington are broadcast 15 times daily by station 2YA of the N.Z. Broadcasting Service. At Onerahi, Karapiro, New Plymouth, Kaimate and Gebbies Pass these are automatically impressed on the records the arrangement described by B. H. OLSSEN (N.Z.J.Sci.Tech. Vol.37 No.2, 1955 Sept.). At other stations except Wellington the operat depresses a hand key on hearing the signal. At Wellington, the t marks on the record are directly derived from the national time service.

TECHNICAL STAFF.

Superintendent: R. C. Hayes

Geophysicists: R. R. Dibble, M.Sc.; G. A. Eiby, M.Sc.; M. G. Muir, M.Sc.; A. A. Thomson, M.Sc.

Technicians: B. R. Gibson; J. Rappange.

STATION READINGS

Details of N.Z. earthquakes have been omitted if the Instrumental Magnitude was less than 5; but the epicentres of those with magnitude greater than 4 and details of felt shocks are listed in the section 'Principal New Zealand Earthquakes'.

When the horizontal components at a recording station are not oriented north and south or east and west, the directions are designated X and Y, and identified in the section 'Stations of the N.Z. Network'.

All times are given in U.T.; that is, the civil time of the Greenwich meridian, beginning at midnight. New Zealand Standard Time is 12 hours ahead of U.T.

The small letters following the time of an 'impetus' phase indicate the direction of first motion. u indicates an upwards ground movement, d a downwards one, n, s, e and w towards north, south, east and west respectively. x and y are horizontal movements as explained above.

Amplitudes are given in microns (1 micron = 10^{-6} metre) and periods in seconds.

Magnitudes for local earthquakes are a mean of the indications of the Wood-Anderson seismographs of the network.

The accuracy of local earthquake epicentres is indicated by a letter in brackets following the attribution N.Z.

(A) Epicentres are not in error by more than 5 miles, or 8 km.

(B) " " " " " " " " 10 " " 16 "

(C) " " " " " " " " 15 " " 24 "

(D) more uncertain.

In indicating focal depth, a distinction is made between shallow earthquakes (S), whose records show clear crustal pulses, and normal earthquakes (N) which probably originate near the base of the crust.

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 1	WN	eP	NZ	23	17	35d?							
		ipP	Z		18	20u							
		ePP	N		20	00							
		iS	N		24	43			4	5			
		i	N		26	10							
		iSS	N		29	23			6	5			
		eSSS	N			32.0							
		eLr	N			37ca			4	15			
	CH	eP	N	23	17	35							
		eS	N			24.8							
		e	NE			30½							
	ON	eP	E	23	17	26							
		epP	E		18	05							
	KP	eP	N	23	17	37							
		eS	N		24	47							
	TU	eP	N	23	17	45							
		e	N		18	10							
	CB	eP	E	23	17	25½							
		epP	E		18	10							
	KM	eP	X	23	17	28							
	Epicentre:			23	08	28	7S 129E 150km					USGGS	M 6.
2	WN	eP	NZ	09	32	12							
		eS	NZ		35	26							
	ON	eP	E	09	31	32							
	CB	eS	E	09	35	34							
	KM	eS	X	09	35	58							
	Epicentre:			09	27	11	18S 179W					USCGS	
							No L-waves, probably deep focus.						
8	WN	eL	N	07	59ca		Guerro, Mexico					USCGS	
8	ON	eP	E	08	19	08							
		e	E		21	53							
	TU	eP	N	08	18	45							
		iS	N		19	03							
	WN	iP	ZN	08	19	01½u							
		S	N			34							
	CB	eP	E	08	19	09							
		S	E			49							
	KM	eP	X	08	19	35							
		S	X		20	27							
	CH	eP	Y	08	19	38							
		S	Y		20	35							
	Epicentre:			08	18	08	38.75S 175.65E 140km					NZ (B)	M 5.
8	WN	eP	NZ	18	54	18							
	CB	eP	E	18	54	12							
	KM	e(P)	X	18	54	4							
	Epicentre:			18	46	29	4½S 153E					USCGS	
8	WN	(P)	Z	21	07	52							
		e	N		08	18							
		eSKS	N		18	12			4	8			
		eS	N			50			14	18			
		eSS	N		25	1							
		eL	N		33	9							
	CH	SKS	NE	21	18	18nw							
		S	NE		19	02se							
		eSS	NE		25	40							
		eLq	E		32								
		eLr	NEZ		38								
	Epicentre:			20	54	13	19S 70W					USCGS	M 7.

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 9	WN	iP	NZ	12	09	34u				8	5		
		i	Z		10	02u							
		i	NZ		11	00							
		isP	NZ		12	00							
		iS	NZ			28				18	10		
		eScP	NZ		16.1								
		e	NZ		19	49							
		iScS	NZ			55							
	CH	e(P)	N	12	10	00							
		e	N			04							
		isP	Z		12	30u							
		esP	NE			32							
		S	NE		13	09							
		iScS	NE		20	02u							
	ON	P	E	12	08	50¾w							
		iS	E		11	14½w							
		eScS	E		19	43							
	AK	iP	N	12	08	58s							
		S	N		11	28							
	KP	P	N	12	09	06							
		i	N			08							
		e	N			20							
		e	N			44							
		esP	N		11	15							
		S	N			41							
		e	N		20	13							
	TU	eP	N	12	09	08							
		i	N			10							
		e	N			42							
		esP	N		11	28							
		S	N			48							
		iScS	N		19	46s							
	CB	eP	E	12	09	37							
		e	E			39							
		esP	E		12	06							
		S	E			34							
		eScS	E		19	53							
	KM	eP	X	12	09	52							
		i	X			55							
		esP	X		12	29							
		S	X		13	00							
		eScS	X		19	58							
	Epicentre:			12	05	53	23S 179E 650km					USCGS	M 6.1 WN
10	WN	e(P)	NZ	08	56	51							
		e(PP)	N		57	12							
		eS	NZ		59	45							
		Lmax	N	09	02								
	CH	iP	NEZ	08	56	59dne							
		eS	N	09	00	50							
	ON	eP	E	09	56	02							
		e(S)	E		58	02							
		eL	E			24							
	AK	P	N	08	55	55n							
		(S)	N		58	50							
	KP	eP	N	08	56	14							
		e	N			31							
		eL	N		59								
	TU	eP	N	08	56	14							
		eS	N		58	25							
		eL	N			59¼							
	CB	e	E	08	57	4							
		eL	E	09	00	5							
	KM	eP	X	08	57	19							
		eS	X	09	00	40							
		eL	X		02	3							
	Epicentre:			08	52	36	25S 176W					USCGS	

Date	Stn	Phase		h	m	s	Az Tz An Tn Ae Te	
JAN 10	WN	eP	NZ	10	22	28		
		eS	NZ		25	23		
	ON	eP	E	10	21	52		
	TU	eS	N	10	24	15		
	KM	eS	X	10	26	33		
	Epicentre:			10	18	25	25S 176W	USCGS
10	WN	eS	NZ	22	01	08		
		eL	N		02			
	CH	eL	EN	22	05ca			
	AK	eL	N	22	01.3			
	CB	eS	E	22	01	26		
	Epicentre:			21	54	05	25S 175½W	USCGS
11	WN	eP	N	10	49	24		
		eS	NZ		52	14		
		eL	N		53	30		
	CH	eL	EN	10	55			
	AK	eL	N	10	51.5			
	TU	eS	N	10	51	06		
	KM	eS	X	10	53.3			
	Epicentre:			10	45	30	Kermadec Is. region	USCGS
11	ON	P	E	05	41	23		
		S	E		42	02		
	AK	(P)	N	05	41	15		
		S	N			39		
	KP	iP	N	05	40	58.3s		
		iS	N		41	23s		
	TU	(P)	N	05	41	03		
		S	N			30		
	WN	iP	ZN	05	41	05½us		
		S	N			35		
	KM	eP	X	05	41	30		
		S	X		42	19		
	CH	P	Y	05	41	36		
		S	Y		42	29		
	Epicentre:			05	40	27	39.2S 174.85E 180km NZ (B)	M
							Felt central and southern parts o	
							Is, and northern parts of South I	
							max MM3 at Ohakune, Hunterville,	
							virke, Bunnythorpe, Foxton and Ne	
11	WN	eP	NZ	12	02	31		
		ipP	NZ			52		
	TU	eP	N	12	02	46		
	KM	eP?	X	12	02.6			
	Epicentre:			11	54	59	Solomon Is. region 100 km	USCGS
11	ON	P?	E	15	00	31		
		S	E		01	21		
	TU	eP	N	15	00	34		
		S	N		01	16		
	WN	eP	NZ	15	01	10		
		iS	NZ		02	24		
	KM	eS	X	15	03	23		
	CH	eS	Y	15	03	30		
	Epicentre:			14	59	36	35¾S 179¼E N	NZ (D)

e	Stn	Phase		h	m	s	Az Tz An Tn Ae Te	Mag.
12	AK	eL	N	06	09			
	WN	e(P)	N	06	05	25		
		e(S)	N		08	39		
		eL	N		10½			
12	WN	e	N	06	17	17		
		eL	N		19			
	CH	eL	Z	06	23			
	AK	eL	N	06	17			
	Epicentre:			06	10	25	22½S 177½W	USCGS
12	ON	P	E	12	11	51w		
		i	E			52e		
		eS	E		13	22		
	AK	iS	N	12	13	31s		
	KP	eP?	N	12	11	57½		
		eP	N			59		
	TU	eP	N	12	11	58		
		S	N		13	35		
	WN	eP	N	12	12	31		
		S	N		14	39		
	CB	eP	E	12	12	43		
		eS	E		14	56		
	KM	eP	X	12	13	05		
		S	X		15	28		
	CH	eS	Y	15	15	39		
	Epicentre:			12	09.9		Kermadec Is. region. NZ	
							Appears deep. No L-waves	
13	WN	e	H	01	09ca			
13	WN	eP	N	03	08	52		
		eL	N		13½			
	CH	eL	Z	03	15			
	AK	e	N	03	09	43		
		eL	N		11.3			
	KP	eL	N	03	13			
	CB	eL	E	03	14			
	Epicentre:			03	04	36	Samoa Is. region 650km	USCGS
							Recorded L-waves suggest a shallower depth	
13	KP	e(P)	N	06	13	14		
	TU	e(P)	N	06	13	10		
	WN	e(P)	N	06	13	50		
	Epicentre:			06	10	25	22½S 177½W	USCGS
13	WN	iP	NZ	06	19	21dn		
		i	NZ			25dn		
		S	H		22	05		6 8
		eL	H		23.0			
		eL	NZ		24	35		
	CH	P	Z	06	19	29u?		
		e	E		21.9			
		eL	Z		23½			
	ON	P	E	06	18	16		
		e	E			27		
		e	E			37		
		eL	E		21			
	AK	eL	N	06	20.8			
	KP	eP	N	06	18	45		
		eS	N		20	43		
		eL	N		21	23		
	TU	eP	N	06	19	11		

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		
JAN 13	CB	eP	E	06	19	07								
		e				11								
		eL	E			23½								
	KM	eP	X	06	19	27								
		eL	X			24								
	Epicentre:			06	16	14	29S 167½E						USCGS	
13	KP	eP	N	07	35	51								
		S	N			36	53							
	TU	eS	N	07	37	14								
	WN	e	N	07	37	44								
		iS	N			38	11½							
	CB	eS	E	07	38	06								
	Epicentre:			07	34.5		Near 33S 178E						NZ	
13	TU	eS	N	12	18	27								
	WN	eP	NZ	12	16	41								
		eS	NZ			19	33							
	CB	e(P)	E	12	17	02								
		eS	E			20	03							
	KM	eS	X	12	20	46								
	Epicentre:			12	12	41	24S 177W No L-waves. Probably deep focu						USCGS	
14	WN	e	N	04	34		Traces only							
14	KP	eP	N	14	21.5									
	WN	eL	N	14	54ca									
	CH	eSKS	NE	14	33.0									
		e	E			44.1								
		eL	N			47½								
	Epicentre:			14	08	41	51½N 173W						USCGS	
14	AK	eL	N	22	22.0									
	CB	eP	E	22	15	17								
	WN	e(S)	N	22	19	07								
	CH	eL	NEZ	22	22									
	Epicentre:			22	10	27	Tonga Is. region						USCGS	
15	ON	eP	E	10	20	10								
		ePP	E			29								
		e	E			53								
	AK	eL	N	10	24.0									
	KP	eL	N	10	25									
	CB	eS	E	10	24	02								
	WN	eP	N	10	20	50								
		eS	N			23	42							
	CH	eL	NEZ	10	28									
	Epicentre:			10	16	45	25S 176W						USCGS	
15	AK	eL	N	18	48.5									
	WN	eS	N	18	48	54								
	CH	eL	NEZ	18	53									
	Epicentre:			18	42	03	Tonga Is. region						USCGS	
16	WN	eP?	Z	23	51	31								
		e	Z			44								
		iPP	Z			55	49d							
		SKS	N	24	02	08				2	7			
		S	N			03	10			3	8			

te	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
N 16	WN	ePS	Z		04	46								
		ePPS	N		05	09								
		eSS	N		10	04				7	20			
		e	N		14	22								
		eLq	N		19	½								
		Lr	Z		24	32				12	20			
	CH	P	EZ	23	51	41de								
		ePP	NEZ		55	49								
		iSKS	NEZ	24	02	16								
		eS	N		03	.5								
		ePS	NE		04	53								
		e	E		06	41								
		e	N		10	30								
		eLq	NE		20									
		eLr	NEZ		25									
	ON	eSKS	E	24	02	13								
	AK	eS	N	24	03	00								
		eSS	N		10	22								
	CB	eL	E	24	25									
	KM	eL	X	24	30									
	Epicentre:			23	37	37	½S 80½W						USCGS	M 6.9 WN
18	ON	eP	E	09	40	00								
	Epicentre:			09	34	52	14½S 167E						USCGS	
19	ON	eP	E	18	13	59								
		e	E		14	19								
	KP	eP	N	18	14	15								
	Epicentre:			18	07	07	6S 155E						USCGS	
20	ON	eP	E	09	04	58								
		e	E		05	12								
		e	E			24								
	AK	e	N	09	05	07								
		e	N			45								
	TU	iP	N	09	04	04n								
		i	N			06								
		S	N			24								
	NP	e(P)	E	09	04	35								
		e	E			59								
		eS	E		05	07								
	WN	iP	NZ	09	04	22								
		S	N			53								
	CB	eP	E	09	04	41								
		S	E		05	29								
	KM	S	X	09	06	00								
	CH	eS	Y	09	05	56								
	Epicentre:			09	03	39	40.25S 178.1E			N			NZ (B)	M 5.0 NZ
20	ON	P	E	18	01	38.5								
		e	E			42								
		eS	E		02	17								
	AK	eP	N	18	01	27								
		S	N			53								
	TU	eP	N	18	01	20.1								
		iS	N			41.5								
	NP	iP	E	18	01	23.9w								
		eS	E			49								
		e	E		02	01								
	WN	iP	NZ	18	01	37.3us								
		S	N		02	13.0								
	CB	eP	E	18	01	43								
		S	E		02	25								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JAN 20	KM	eP	X	18	02	07							
		S	X		03	02							
	CH	P	Y	18	02	10							
		S	Y		03	10½							
	Epicentre:						38.6S 175.8E 185km					NZ (C)	
	ON	eP	E	23	30	29							
	KP	eP	N	23	30	46							
	TU	eP	N	23	30	59							
	WN	iP	Z	23	31	06½							
	KM	eP	X	23	31	06							
		e(pP)	X			34							
	CH	eP	Y	23	31	16							
	Epicentre:			23	23	40	5S 155E		150km			USCGS	
21	WN	e	N	07	45	42	Felt Raoul Is. MM2 at 07 42						
		eP	NZ	12	27	00							
		i	N			03							
		eS	NZ		30	12							
	CH	eS	N	12	31	05							
		eL	NEZ		33								
	ON	eP	E	12	26	17							
	AK	e	N	12	30½								
	KP	eP	N	12	26	28							
	TU	eP	N	12	26	30							
		eS	N		29	04							
	CB	e	E	12	27	23							
		eS	E		30	27							
	KM	eP	X	12	27	26							
		eS	X		31	05							
	Epicentre:			12	22	42	23S 176W					USCGS	
22	ON	eP	E	10	15	31	Felt Raoul Is. MM3 at 10.20						
	WN	eS	N	10	18	30							
23	ON	P	E	07	45	51½							
	KP	eP	N	07	46	03s							
		e	N			25							
	TU	e(P)	N	07	46	14							
	WN	iP	NZ	07	46	08u							
		e	N	08	16								
	CB	P	E	07	46	01							
	KM	e(P)	X	07	46	08							
	Epicentre:			07	36	49	24N 122E No L-waves.					USCGS	
24	ON	P	E	08	53	54							
	Epicentre:			08	49	07	16½S 167E					USCGS	
25	WN	eP	N	10	51.7								
		eS	N		54	38							
		e(L)	N		55½								
	CH	eL	NE	10	57								
	ON	eP	E	10	50	58							
	AK	eL	N	10	54								
	KP	eP	N	10	51.3								
	TU	eS	N	10	53	19							
	CB	eS	E	10	54	38							
	KM	e	X	10	55½								
	Epicentre:			10	47	53	Tonga Is. region					USCGS	

e	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
26	ON	P	E	23	31	25w							
		e	E		33	43							
	KP	eP?	N	23	31	27							
		eP?	N			32							
		eS	N		32	46							
	TU	eP	N	23	31	30							
		S	N		32	40							
	WN	eP	N	23	32	05ca							
		S	N		33	50							
	CB	eP	E	23	32	18							
		S	E		34	09							
	KM	eP	X	23	32	50ca							
		eS	X		34	48							
	Epicentre:			23	29	56	33½S 179W					NZ (D)	M 5.7 NZ
27	WN	eP	NZ	13	42	39							
		eS	NZ		45	29							
		e	N			56							
		e	N		46	20	Prominent						
	CH	ePP	Z	13	43	55							
		eS	NE		46.5								
		eL	NE		48.5								
	ON	eP	E	13	42	05							
		ePP	E			21							
	AK	L	N	13	45	05							
	KP	eP	N	13	42.3								
		eL	N		45.2								
	TU	eS	N	13	44(28)								
	CB	eS	E	13	45	54							
	KM	e(S)	X	13	46.6								
	Epicentre:			13	38	45	26S 176W					USCGS	
28	WN	eP	Z	07	50	39							
		epP	Z		51	05							
		S	N		56	56	4 7						
		eL	N	08	01								
	CH	eP	Z	07	50	49							
		e(S)	E		57	15							
		eL	NE	08	00¾								
	ON	eP	E	07	50	09							
	AK	eL	N	08	00								
	KP	eP	N	07	50	22n							
	KM	eP	X	07	50.8								
	Epicentre:			07	42	52	4½S 151½E		150km			USCGS	M 6.3 WN
29	ON	P	E	04	41	27							
		e	E			55							
	TU	eS	N	04	44	49							
	CB	eS	E	04	45	25							
	WN	eP	NZ		41	38							
		eS	NZ		45	14							
29	ON	P	E	11	52	39							
	TU	eS	N	11	54	36							
	WN	eP	NZ	11	53	23							
		eS	NZ		55	35							
	CB	eS	E	11	55	50							
	KM	eS	X	11	56	27							
	CH	eS	N	11	56	35							
30	ON	P	E	08	38	05							
	Epicentre:			08	34	32	Fiji Is. region 600 km					USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	
JAN 30	KP	e	N	08	43	28.5							
		iP*	N			29.3s							
		iPg	N			35.0n							
		Sn	N			48							
	TU	Pn	N	08	43	29.9s							
		eP*	N			33.5							
		ePg	N			39.9							
		eSn	N			56							
	AK	Pg	N	08	43	37n							
		eSn	N			51							
	ON	iP*	E	08	43	45.0w							
		ePg	E			49							
	NP	e	E	08	43	55½							
		eP*	E			59½							
	WN	Pn	NZ	08	44	12							
		P*	N			25							
		Pg	N			38							
		Sn	N		45	01							
	KM	e(Pn)	X	08	44	50							
		e	E		46	27*							
	CH	eP?	Y	08	45	02							
		e	Y			16							
	Epicentre:			08	43	00	36.9S 177.1E		S			NZ (B)	

Felt extensively in Auckland prov and in southern Northland. MM3 Auckland City. Felt most extens around the shores of the Bay of P MM5 at Opotiki and MM4 at Thames Tauranga. An isoseismal map is reproduced in this bulletin.

30	KP	eP*	N	09	47	52½							
		iPg	N			58.1n							
		Sn	N		48	13½n							
	TU	iPn	N	09	47	54.8s							
		eP*	N			57.2							
		Sn	N		48	21½							
	AK	P*	N	09	48	05							
		e(S)	N			33							
	ON	eP*	E	09	48	08.6							
		ePg	E			13							
		e	E			20½							
	NP	eP*	E	09	48	24							
	WN	ePn	NE	09	48	35½							
		e	N			43							
		eSn	N		49	29							
	CB	ePn	E	09	48	46½							
	KM	eP?	X	09	49	21							
	Epicentre:			09	47	25	36.9S 177.1E		S			NZ (C)	

Aftershock. Felt mainly around s of Bay of Plenty, max. MM3 at Tau and Waihi.

30	KP	e	N	10	02	18½							
		eP*	N			20							
		ePg	N			24							
		iSn	N			37n							
	TU	Pn	N	10	02	22.2s							
		eP*	N			26½							
		Sn	N			47½							
	AK	(Pg)	N	10	02	33							
		e(Sn)	N			49							
	ON	eP*	E	10	02	35.1							
		ePg	E			40							
		eSn	E			59							

te	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
N 30	NP	e(Pn)	E	10	02	39							
		eP*	E			53							
		ePg	E		03	02							
	WN	iPn	Z	10	03	00u							
		eP	N			01							
		e(P*)	N			10½							
		ePg	N			26							
		eSn	N			54							
	CB	ePn	E	10	03	14							
	KM	eP?	X	10	03	45							
		eP	X			47							
	CH	eP?	Y	10	04	00							
	Epicentre:			10	01	51	36.9S 177.1E		S			NZ (B)	M 5.6 NZ

30	WN	iP	NZ	19	12	44							
		i	NZ			48							
		iS	NZ		15	36							
	CH	eS	N		16	39							
	ON	iP	E	19	11	58.3w							
		S	E		14	09½							
	KP	eP	N	19	12	14							
		eS	N		14	40							
	TU	eP	N	19	12	17							
		S	N		14	43							
	CB	P	E	19	12	51							
		S	E		15	44							
	KM	eP	X	19	13	07							
		eS	X		16	07							
	Epicentre:			19	09	12	400 miles south of Fiji. 500km					USCGS	

31	KP	eP	N	00	44	14							
	Epicentre:			00	39	05	14½S 167E					USCGS	

31	ON	e	E	07	10	19							
		e	E		11	11							
	KP	P	N	07	09	36.7n							
		e	N			52							
		eS	N		10	00½							
	TU	iP	N	07	09	17n							
		S	N			26½							
	NP	iP	E	07	09	(50)e							
		iS	E		10	(22)							
	WN	P	NZ	07	09	49½d							
		i	N		10	01							
		S	N			25							
	CB	eP	E	07	10	05							
		e	E			21							
		S	E			54							
	KM	eP	X	07	10	32							
		S			11	30							
	Epicentre:			07	09	04	39.2S 177.5E		70km			NZ (C)	M 5.1 NZ

Felt Tuai MM4.

31	WN	iP	NP	09	24	36							
		e(pP)	Z		25	44							
		eS	N		30	30					5	2	
		iS	NZ			32							
		i	Z			38							
		eScS	N		33	44							
	CH	eS	N	09	30.9								
		e	NE		34	50							
	ON	P	E	09	24	03							
	KP	iP	N	09	24	21.1n							
		e	N		30	19							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		
JAN 31	TU	iP	N	09	24	30½								
		S	N		30	20								
	CB	P	E	09	24	29½								
		epP	E		25	43								
		eS	E		30	20								
	KM	eP	X	09	24	35								
		eS	X		30	31								
	Epicentre:			09	17	11							4S 152E	400km USCGS
FEB 1	WN	iP	NZ	01	37	50								
		i(PP)	H		38	26								
		eS	NZ		41	49								
		eL	H		43	ca								
	ON	eP	E	01	36	55								
	KP	eP	N	01	37	15								
		eS	N		40	40½								
	TU	P	N	01	37	28½								
		S	N		41	23								
	CB	eP	E	01	37	43½								
		eS?	E		41	34								
	KM	P	X	01	38	01½								
		eS?	X		41	57								
	CH	P	Z	01	38	18								
		eS	N		42	30								
		L	NZ		44	.3								
	Epicentre:			01	32	55							20S 169E	USCGS
1	WN	iP	NZ	13	51	56d								
		i(PcP)	Z		52	36								
		e	Z		53	20								
		ePP	Z		54	06								
		eS	NZ	14	00	07								
		e(S)	N			09								
	ON	P	E	13	51	30								
	AK	P?	N	13	51	49								
	KP	iP	N	13	51	42½								
		ePP	N		53	40								
		eS	N		59	44								
		eScS	N	14	01	03½								
	TU	P	N	13	51	50								
		ePP	N		54	10½								
		eS	N		59	56½								
		e(PS)	N	14	00	36½								
		eScS	N		01	10								
	CB	eP	E	13	51	53½								
		e	E		52	26								
		e	E		53	29								
		eS	E	14	00	01								
	KM	P	X	13	51	57								
		S	X	14	00	13								
	CH	P	Y	13	52	07								
		S	NE	14	00	27								
		ScS	NE		01	29								
		e	E		04	06								
		e(SS)	N		05	24								
		eL	NE		09	ca								
	Epicentre:			13	41	44							19S 145½E	350km USCGS
6	WN	iP	NZ	22	24	11								
		i?	NZ		33	09								
	ON	eP	E	22	23	28								
	KP	eP	N	22	23	42								
		eS	N		26	45								
	TU	eS	N	22	26	40½								
		e	N		27	02								

Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
6 CB	eP	E	22	24	14							
	eS	E		27	35							
CH	e?	Z	22	26	40							
Epicentre:			22	19	50						24S 172½W	NZ M 6.0 NZ
Pasadena and Apia readings also used in determining epicentre.												
7 WN	P	NZ	14	42	08							
	S	NZ		44	02							
ON	S	E	14	43	14							
KP	S	N	14	43	28							
CB	eS	E	14	44	06½							
KM	eS	X	14	44	23							
8 WN	iP	N	10	33	51½d							
	e(S)	N		34	28							
	iS	N			32½							
ON	P	E	10	33	48½							
	S	E		34	27							
AK	eP	N	10	33	38							
	S	N		34	(05)							
KP	iP	N	10	33	27½n							
	S	N			52							
TU	iP	N	10	33	33½s							
	e(S)	N			57							
	iS	N			59n							
NP	iP	E	10	33	38w							
	S	E		34	08½							
KM	P	X	10	34	19							
	S	X		35	18							
CH	eP	Y	10	34	25							
	S	Y		35	30							
Epicentre:			10	32	59						38.3S 176E	210km NZ (C) M 5.9 NZ
Felt central and south-west parts of North Is. and Greymouth; max MM3-4 at Wanganui and Wellington.												
9 WN	eL	H	15	19	.5							
ON	eP	E	14	46	02½							
AK	SKS	N	14	57	15							
	eL	N	15	12	.0							
9 KP	eSKS?	N	14	57	55							
	eS?	N		58	24							
	eL	N	15	19	.4							
TU	eP	N	14	46	07							
	eSKS	N		57	57							
	eS	N		58	24							
	eL	N	15	15	.9							
KM	e?	X	14	59	59							
	e?	X	15	01	18							
CH	eSKS	N	14	58	12							
	ePS?	E		59	22							
	ePPS	NEZ	15	00	20							
	SS	NEZ		05	04							
	e	NE		08	38							
	e	E		11	52							
	e(Lq)	NE		13	46							
	eLr	EZ		17	52							
Epicentre:			14	32	38						32N 116W	USCGS
12 WN	eP	NZ	12	01	26							
	i	Z			36							
	e	N			37							
	i	Z			38							
	e	H		02	07							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	
FEB 12	WN	eS	H		11	33							
		e	H			54							
	ON	eP	E	12	01	09							
		eS	E		10	48							
	AK	eP	N	12	01	15							
		iS	N		11	02s							
		e(SKS)	N			19							
	KP	eP	N	12	01	16							
		eS	N		10	57½							
	TU	P	N	12	01	39							
		eS?	N		10	46							
	NP	eP	E	12	01	21							
		eS	E		11	11							
	CB	eP	E	12	01	25							
	KM	eP	X	12	01	35							
	CH	P	NZ	12	01	28							
		S			11	28							
		e	N		20	31							
		e	E		22	44							
		eL	N		27	44							
	Epicentre:			11	49	20	19N 119½E						USCGS M6
15	WN	P	N	01	38	27							
		S	N		41	34							
	KP	eP?	N	01	37	53							
	TU	ES	N	01	40	34½							
	CB	eP?	E	01	38	31							
		eS	E		41	47							
	KM	eP	X	01	38	46							
		eP?	X		41	25							
		eS	X		42	22							
	Epicentre:			01	34	28	23¼S 178¼W		N?				NZ
							Apia, Noumea, Riverview readings used in determining epicentre.						
16	WN	eP	N	16	54	11							
		Sn	N		55	16							
	ON	e	E	16	50	56							
		Pn	E		53	24							
	KP	ePn	N	16	53	23							
		eP6.2	N			43							
	TU	Pn	N	16	53	20							
		Sn	N		54	07½							
	NP	eP	E	16	53	55							
		eS	E		55	16							
	CB	eP	E	16	54	21							
		eSn	X		55	37							
	Epicentre:			16	52	18	35.1S 179.8W		S				NZ (D)
17	WN	iPn	N	09	43	52s							
		iSn	N		44	06s?							
	ON	eP	E	09	45	16½							
		e(S)	E		46	15½							
	KP	ePn	N	09	44	38							
		eP	N			54							
		e(S)	N		45	40½							
	TU	ePn	N	09	44	36							
		P	N			56							
		e(S)	N		45	44							
	NP	eP	E	09	44	47½							
		eP	E			39							
		eP	E			45							
		Sn	E			59							
		S	E		45	09½							

Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
17 CB	iPn	E	09	43	57½								
	iSn	E		44	15								
KM	iPn	X	09	44	06sw								
	(S)	X			26½								
CH	ePn?	Y	09	44	03½								
	P	Y			06								
	P	Y			11								
	P	Y			19								
	e(Sn)	Y			36								
	eS	Y			41								
Epicentre:			09	43	33½	42.2S 174.0E		S				NZ (C)	M 5.0 NZ
						Felt Blenheim MM4							
18 WN	iP	NZ	07	45	35d								
	iPcP	N			40								
	pP	Z		47	22								
	i	Z		54	38								
	iS	NZ			45								
	i	NZ			48								
	e	N		56	21								
ON	P	E	07	45	13½e								
	S	E		54	08e								
	(SP)	E			47								
AK	P	N	07	45	20n								
	iS	N		54	20n								
KP	eP	N	07	45	23½								
	iP	N			25n								
	e(pP)	N		47	08								
	iS	N		54	30n								
	esP	N		55	06								
TU	P	N	07	45	30n								
	iS	N		54	37								
	eScS	N		55	03½								
	eSP	N			21								
TO	P	Z	07	45	26½d								
	eS	Z		54	35½								
	e(ScS)	Z		55	10								
NP	P	E	07	45	29½e								
	eS	E		54	32								
	eScS	E			56								
CB	P	E	07	45	32								
	iS	E		54	42								
KM	P	X	07	45	36½sw								
	iS	X		54	49½ne								
	(SP)	X		55	35								
CH	iP	NEZ	07	45	42d								
	epP	Z		47	24								
	sPcP?	NZ		48	14								
	epPP	Z		50	23								
	S	N		55	01								
	iS	NEZ			03								
	SP	NZ			56								
	sS	E		58	03								
Epicentre:			07	34	16	30N 137½E		450km				USCGS	M 7.8 NZ
19 CH	L	NEZ	03	08.0									
	L	NE		17ca									
Epicentre:			02	18	00	52N 131½W						USCGS	
19 WN	eP	Z	05	44	58								
	eS	N		48	18								
TU	e	N	05	47	16½								
	e	N			32								
CB	eS	E	05	48	35								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		
FEB 18	KM	eS	X	05	49	12								
	CH	eS	Y	05	49	26½								
	Epicentre:			05	40	22	23S 176W						USCGS	
19	WN	iP	Z	14	52	40d								
		S	N		55	51½								
	ON	(P)	E	14	51	58								
	KP	iP	N	14	52	01s								
		eS	N		55	00								
	TU	P	N	14	52	15								
		eS	N		54	59								
	NP	P	E	14	52	30w								
		S	E		55	29								
	CB	P	E	14	52	44								
		eS	E		55	54								
	KM	eP	X	14	53	02½								
		eS	X		56	32								
	CH	eP	Y	14	53	19								
		eS	Y		56	48½								
	Epicentre:			14	48	45	22½S 180			600km			USCGS	
21	WN	P	Z	05	13	14								
		S	N		16	13½								
	KP	eS?	N	05	15	21								
	TU	eS	N	05	15	22								
	CB	eP	E	05	13	19								
		eS	E		16	15								
	KM	eS	X	05	16	43								
	Epicentre:			05	09	22	24½S 179¾W		N				NZ	
							Several overseas stations also u							
							in determining epicentre							
				05	09	13	Fiji Is.						USCGS	
21	WN	iP	Z	20	36	54u								
		S	N		40	01								
		iScS	NZ		47	03u								
	ON	eiP	E	20	36	13½								
		(S)	E		38	52								
	KP	eP	N	20	36	27½								
		eS	N		39	13½								
	AK	eS	N	20	39	05								
	TU	S	N	20	39	14								
		eScS	N		46	51½								
	NP	eS	E	20	39	40								
	CB	eP	E	20	36	57								
		eS	E		40	06								
		eScS	E		46	58								
	KM	eP	X	20	37	21½								
		eS	X		40	32								
	Epicentre:			20	32	55	22S 179W			650km			USCGS	
24	WN	ePn	Z	09	20	43								
		P	Z		21	06								
		eSn?	N		22	03								
		S	N			05½								
	ON	iP	E	09	20	13w								
	AK	P	N	09	20	04								
		i	N			24								
		e(S)	N		21	04								
		e?	N		23	17								
	KP	ePn	N	09	20	06½								
		P	N			22								
		(Sn)	N			58½								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
EB 24	TU	Pn	N	09	20	02								
		iSn	N			53								
		i	N		21	05½								
	TO	ePn	Z	09	20	18½								
		eS	Z		21	36½								
	NP	eP	E	09	20	34½								
		e(Sn)	E		21	38								
	CB	ePn	E	09	20	58½								
		eP	E		21	21								
		eSn?	E		22	23½								
		(Sn)	X			26½								
	KM	ePn	X	09	21	24								
		eSn?	X		23	03								
		(Sn)	X			05½								
	CH	ePn?	Z	09	21	22								
		ePn?	Z			28½								
		eSn	eY		23	09								
		eS	E			30								
		L	N		24	08								
	Epicentre:			09	18	57	35.0S 179.6W		S				NZ (C)	M 5.9 NZ
							Several overseas stations also used for determining epicentre							
				09	19	01	32S 179½E						USCGS	
27	WN	iP	N	03	28	10u								
		(S)	N			40½								
		iS!	N			41								
	ON	eP	E	03	28	25								
	KP	P	N	03	28	03n								
		eS	N			29								
	TU	eP	N	03	28	08								
		e	N			33½								
		S	N			36½								
	TO	iP!!	Z	03	27	58½								
	NP	iP	E	03	27	58½e								
		iS	E		28	21¾w								
	CB	iP	E	03	28	12¾								
		iS	E			46								
	KM	eP	X	03	28	33½								
		S	X		29	19¼								
	CH	eP	Y	03	28	39								
		eiS	Y		29	31								
	Epicentre:			03	27	29½	39.2S 174.8E			200km			NZ (B)	M 5.3 NZ
28	WN	eP?	Z	16	33	30								
		S	N		34	52								
	ON	e	E	16	33	01								
	KP	e	N	16	32	56								
	TU	eP	N	16	32	49½								
		S	N		33	42½								
	KM	eS	X	16	35	53								
	Epicentre:			16	31	42	34.9S 179.1W		N				NZ (C)	M 5.0 NZ
AR 2	ON	eP	E	19	43	48								
	KP	eP	N	19	43	58								
		e(S)	N		46	.6								
	WN	P	Z	19	44	26								
		S	Z		47	31								
	CB	eP	E	19	44	29								
		e(S)	E		47	.6								
	KM	eP	X	19	44	.9								
2	ON	e	E	22	44	45								
		e	E			53								
		iPg	E			57								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	
MAR 2	KP	iPn	N	22	44	08.7n							
		eP*	N			09.8							
		ePg	N			10.3							
		eS	N			23							
	TU	iPn	N	22	44	10.7							
		iP*	N			12.2							
		e	N			16							
		S*	N			27							
	WN	iPn	Z	22	44	30.4u							
		ePn	N			30.8							
		i	N			33.8							
		iP*	N			37							
		S*	N		45	10							
	CB	Pn	E	22	44	41.0							
		e	E			44							
		eP*	E			48							
		S*	E		45	28							
	KM	e	X	22	45	09							
		e	X			12							
		e(P*)	X			23							
		iPg	X			32							
		e(S)	X		46	09							
	CH	eP*	Y		45	28							
		e	Y		46	47							
	Epicentre:			22	43	51							38.85S 175.7E S NZ (B) Felt in central North Is. MM7 s Tokaanu. An isoseismal map is n in this bulletin.
3	ON	eP	E	00	10	37½							
	AK	P	N	00	10	(50)							
		eL	N			17							
	KP	eP	N	00	10	52							
		eL	N			18.1							
	TU	eP	N	00	10	55							
		eL	N			18½							
3	WN	eP	NZ	00	11	18							
		eS	N			16 10							
		eL	N			19							
		iScS	N			22 05							
	CB	eS	E	00	16	24							
	KM	eP	X	00	11	41							
	Epicentre:			00	05	25							15S 173½W USCGS
5	WN	P	Z	23	42	43							
		i	Z			56							
	Epicentre:			23	29	41							44½N 144E USCGS
8	KP	eP	N	08	11	21½							
		e	N			41							
	TU	eP	N	08	11	32							
	TO	iP	Z	08	11	31½d							
		e	Z			49							
	WN	iP	NZ	08	11	49d							
	CB	eP	E	08	11	46							
	KM	eP	X		12	00							
10	KP	eP	N	03	47	14½							
	TU	eP	N	03	47	15							
	CB	eP	E	03	47	53							
	Epicentre:			03	42	10							17½S 173E USCGS

ate	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AR 10	KP	e	N	19	40.6								
	AK	eL	N	19	41.5								
	TU	eS	N	19	39	32							
	WN	eP	ZN	19	37	27							
		eS	ZN		40	37							L-waves well developed
	Epicentre:			19	33	40							22½S 176W 200km USCGS
10	KM	eP	X	20	16	38							
		S	X		17	19							
	CH	eS	X	20	17	24							
	CB	eP	E	20	16	59							
		S	E		17	59							
	WN	eP	NZ	20	17	16							
		S	Z		18	20							
		eS	N			22							
	Epicentre:			20	15	42							45S 168E NZ (D) M 5.0 NZ Felt Central Otago. Max. MM4 at Edievale.
12	AK	eL	N	20	02.3								
	KP	eL	N	20	03								
	TU	eL	N	20	04								
	WN	eL	N	20	05								
	CH	eL	NE	20	05								
		eL	Z		07								
	Epicentre:			19	50	37							15S 175W USCGS
14	KP	e(Pn)	N	14	19	46							
		ePg	N			56							
		eSn	N		20	10							
		i	N			16							
	AK	e	N	14	19	56							
		e	N		20	12							
		e	N			26							
	TO	e	Z	14	20	03							
		eP*	Z			08							
		e	Z			14½							
		e	Z			28½							
		eS*	Z			47½							
	WN	e	Z	14	20	37							
		e	N			39							
		eP*	Z			42							
		e	Z			50							
	KM	e	X	14	21½								
	Epicentre:			14	19	12							36.7S 177.7E S NZ (C) M 5 NZ Uppsala reading used for epicentre. Felt: Auckland, Thames.
14	AK	ePn	N	15	39	22							
		e	N			44							
	KP	ePn	N	15	39	17.1							
		iPg	N			28.8							
		iSn	N			42.8							
		e	N			48							
	TO	e	Z	15	39	36							
		eP*	Z			41							
		ePg	Z			46½							
	WN	ePn	Z	15	40	01							
		eP*	N			15							
		ePg	N			31							
		eSn	N		41	05							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	
MAR 14	KM	e	X	15	40	45							
		eSn	X		41	24							
		Epicentre:		15	38	44	36.7S	177.7E		S		NZ (B)	
				15	38	38	37S	178E				USCGS	
		Noumea, Riverview, Brisbane, Ma											
		Uppsala and Stuttgart readings											
		epicentre. Felt Auckland.											
14	KP	ePn	N	15	43	59½							
		i	N		44	05½							
		ePg	N			09½							
		iSn	N			23							
	TO	e	Z	15	44	17							
		iP*	Z			22½							
	WN	iPn	NZ	15	44	43¾							
		e	NZ			50							
		eP*	N			59							
		eSn	N		45	42							
	KM	eSn	X	15	47	40							
		Epicentre:		15	43	25	36.7S	177.7E		S		NZ (C)	
		Noumea, Riverview, Brisbane, Ma											
		Bozeman, Ottawa, Uppsala, Stutt											
		Strasbourg readings used for ep											
		Felt Auckland and Coromandel Pe											
14	KP	ePn	N	16	14	33							
		i	N			51½							
		iSn	N			59							
	AK	e	N	16	14	41							
		e	N			58							
	TO	e	Z	16	14	45							
		eP*	Z			53½							
		e	Z		15	05							
		eSn	Z			18							
	WN	e(Pn)	ZN	16	15	19							
		e(Sn)	N		16	20							
	KM	e	X	16	15	54							
		Epicentre:		16	13	59	36.7S	177.7E		S		NZ (D)	
		Uppsala and Kiruna readings use											
		epicentre. Phases partly obscur											
		small foreshock. Felt Auckland,											
		Coromandel Peninsula and island											
		Hauraki Gulf.											
15	ON	P	E	08	48	00							
		S	E			37							
	KP	eP	N	08	47	37							
		iS	N		48	00							
	NP	eP	E	08	48	00½							
		eS	E			42							
	TO	iP	Z	08	47	48d							
	WN	iP	NZ	08	48	08							
		S	N			59							
	CB	eS	E	08	49	23							
	KM	eS	X	08	50	02							
	CH	eS	Y	08	50	04							
		Epicentre:		08	47	07	37.6S	177.9E		100km		NZ (C)	
15	KP	ePn	N	17	59	16							
		e	N			22½							
		eSn	N			40							
	ON	ePn	E	17	59	25							
		eP*	E			35							
		iSn	E			58							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
MAR 15	AK	e	N	17	59	46							
		e	N	18	00	23							
	TO	e	Z	17	59	52							
		e	Z	18	00	20							
		i	Z			34							
	WN	e	Z	18	00	06							
		eSn	NZ		01	05							
	CB	ePg	E	18	00	46							
		Epicentre:		17	58	42	36.7S	177.7E		S		NZ (C)	M 5.2 NZ
		Felt Thames and Great Barrier Is.											
16	KP	ePn	N	08	41	27							
		iP*	N			33							
		iPg	N			39							
		iSn	N			53½							
	AK	iPn	N	08	41	28							
	TU	eP*	N	08	41	34							
		i	N			43							
		e	N			44½							
		e(S*)	N		42	00							
	TO	e	Z	08	42	15							
		e	Z			22½							
		e	Z			32							
	WN	eP*	N	08	42	23							
		eS	N		43	16							
	CB	e	E	08	42	23							
		eP*	E			40							
		eSn	E		43	25							
	KM	e	X	08	43	00							
		e	X			29							
		e	X		44	32							
		Epicentre:		08	40	53	36.7S	177.7E		S		NZ (C)	M5½-5½NZ
		Kiruna and Uppsala readings used for epicentre. Felt Auckland, Coromandel Peninsula and islands in the Hauraki Gulf.											
17	KP	ePn	X	02	10	07							
		iP*	X			12							
		eSn	X			33							
	TU	eP*	N	02	10	14							
		e	N			29							
		e	N			38							
17	ON	e	E	02	10	13							
		i	E			19½							
		i	E			23							
		e	E			45							
	WN	e	Z	02	10	52							
		e	Z			58							
		e	N		11	16							
	CB	e	E	02	11	04							
		Epicentre:		02	09	03	36.7S	177.7E		S		NZ (C)	M 5 NZ
		Kiruna and Uppsala readings used for epicentre. Felt Thames.											
19	TU	eP	N	17	43	49							
	WN	eP	N	17	43	50							
		eL	N			53							
	CB	eP	E	17	43	46							
	CH	eP	X	17	43	58							
		eL	NEZ			56							
		Epicentre:		17	35	57	6S	150E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te			
MAR 20	WN	eP	NZ	17	16	33									
		eS	N		19	58									
	Epicentre:			17	12	15	19S	178½W					500km	USCGS	
	20 TU	eP	N	20	19	27									
		eS	N		20	44									
	WN	eS	NZ	20	21	52									
	CB	eS	E	20	22	11									
	23 TO	eP	Z	05	18	30									
	WN	eP	Z	05	18	50									
		eL	N		31										
	CB	eP	E	05	18	57									
	Epicentre:			05	10	48	5S	151E						USCGS	
	23 ON	eP	E	15	01	44									
	KP	eP	N	15	01	57½									
	WN	eP	Z	15	02	38									
	Epicentre:			14	56	52	Tonga Is. region							USCGS	
	23 ON	eP	E	20	07	38									
	KP	eP	N	20	07	55									
	TU	eP	N	20	08	08									
	WN	eP	NZ	20	08	12									
	CB	eP	E	20	08	09									
	Epicentre:			20	00	44	6S	155E						USCGS	
	23 ON	eS	E	22	15	24									
	TU	eS	N	22	17	06									
	WN	S	NZ	22	18	12½									
	CB	eS	E	22	18	31									
	KM	eS	X	22	19	13									
	24 ON	eP	E	21	13	22									
	KP	eP	N	21	13	34									
	TU	eS	N	21	17	36									
	TO	eP	Z	21	13	48									
	CB	eP	E	21	14	10									
	KM	eP	X	21	14	5									
	Epicentre:			21	08	25	Tonga Is. region							USCGS	
	27 ON	eP	E	02	40	11									
		iS	E		41	03½W									
	KP	P	N	02	39	39.1n									
		iS	N		40	16.2s									
	TO	iP	N	02	39	24.0u									
		e	N			34.4									
		S	N			50									
	NP	eP	E	02	39	24.0									
		S	E			46									
	WN	iP	NZ	02	39	02.9u									
		S	N			10.8									
	CB	iP	E	02	39	12.0									
		S	E			27.1									
	KM	iP	X	02	39	32.6									
		S	X		40	01									
	CH	eP	X	02	39	35½									
		S	X		40	04									
	Epicentre:			02	38	51	41.0S	174.3E					60km	NZ (B)	
	Felt extensively in central N														
	Maximum MM5 at Nelson.														

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te				Mag.
R 30	ON	iP	E	07	56	59e										
		e	E		58	04										
		e	E			13										
	KP	eP	N	07	57	(01)										
		e(S)	N		58	(13)										
	TU	eP	N	07	56	58										
		eS	N		58	00										
		e	N			28										
	30 NP	e	E	07	57	35										
		e	E		59	08										
	WN	eP	NZ	07	57	40										
		e	Z			49										
		e	N		59	08										
		eS	N		59	10										
	CB	e	E	07	58	14										
		e	E		59	30										
		eS	E			32										
	KM	e(S)	X	08	00	10										
	Epicentre:			07	55	38	34½S	179½W		h	N?	NZ(D)				M 5.7 NZ
	Brisbane reading used for epicentre.															
	30 ON	eP	E	22	19	23										
	TU	eS	N	22	22	27										
	WN	iP	NZ	22	20	06u										
		iS	NZ		23	33										
	CB	eS	E	22	23	48										
	Epicentre:			22	15	31	22S	176W						USCGS		
PR	1 KP	el	N	11	14.0	ca										
	TU	eL	N	11	12.8											
	WN	eL	N	11	12	ca										
	CH	eL	E	11	09	21										
		eL	N			52										
	2 ON	P	E	16	42	02										
		eS?	E		47	17½										
	KP	e(P)	N		46	(21½)										
		eS	N		47	(36½)										
	TU	eP	N	16	46	15½										
		S	N		47	40½										
	WN	eP	NZ	16	46	49½										
		eS?	Z		48	42										
		iS	NZ			48										
	CB	eS	E	16	49	05										
	KM	e(P)	X	16	47	33										
		eS	X		49	45½										
	CH	eS	Y	16	49	56										
	Epicentre:			16	44	20	31S	179W					200km ca	NZ (D)		M 5½ NZ
	6 WN	iP	NZ	07	30	06										
	CB	eP	E	07	30	03										
	KM	eP	X	07	30	05										
	CH	eP	Z	07	30	02½										
		e	E			06½										
		e?	Z		31	33										
	Epicentre:			07	11	34	36½N	71E					200km	USCGS		
	6 ON	eP	E	16	32	51										
	TO	eP?	Z	16	33	21										
	WN	P	NZ	16	33	35										
		eS	NZ	16	38	08										
	CB	eP	E	16	33	34										
	KM	eP?	X	16	33	46½										
		eP	X			52½										
	Epicentre:			16	27	51	13S	167E					200km	USCGS		M 6¼ WN

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	
APR 7	WN	e?	N	01	55	48							
	CB	e	E	01	56	16							
7	AK	eP?	N	18	02	34							
		iS!	N		03	57n							
	TU	iP	N	18	02	43±1n							
		S	N		04	01½±1							
	NP	eP	E	18	03	05							
		eS	E		04	40							
		e	E		05	03							
	WN	P	NZ	18	03	15u							
		e	N			18							
		i	N			23							
		(S)	N		05	03							
		S	N			05½							
		eScS	N		15	24							
	CB	eP	E	18	03	27							
		e?	E		05	15							
		iS	E			18							
	KM	eP	X		03	47							
		e	X		05	51							
		S	X			54							
	CH	eP?	Y	18	03	46							
		eP	Z			49							
		eP	Y			51½							
		e	NE			56							
		S	NEZY		06	03							
	Epicentre:			18	00	59	33S		178W		350km		NZ (D)
				18	00	57	32S		180		350km		USCGS
7	AK	eP5.4	N	18	05	20							
		eS3.5	N			42							
	TU	ePn?	N	18	05	22½							
		eP	N			32½							
		eSn	N			56							
	NP	e(Pn)?E		18	05	43½							
		eP5.4	E			47½							
		iSn	E		06	21½w							
	WN	ePn	N	18	06	03½							
		eP5.4	N			20½							
		e	N			30½							
		e(Sn)?N			07	01½							
		e(S)?	N			41							
	Epicentre:			18	04	40	36.0S		177.0E		S		NZ (D)
							Felt Hauraki Gulf area						MM3
8	WN	e(L)	N	08	00		Coda for 5 minutes.						
	Epicentre:			07	48	40	Tonga Region						USCGS
8	ON	eP	E	10	35	58½							
	AK	e	N	10	42	28							
	WN	eL	N	10	43.5								
	CH	eL	NE	10	44.0								
	Epicentre:			10	32	47	23S		178W				USCGS
8	ON	eP	E	18	29	39							
		e	E		30	17							
		(S)	E			55½							
	TU	eP	N	18	29	15½							
		S	N			43							
	NP	iP	E	18	28	57½w							
		iS!	E		29	12½							
	WN	iP	N	18	29	04s							
		S	N			22							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
PR 8	CB	iP	E	18	29	07e							
		iS	E			30e							
	KM	eP	X	18	29	29							
		eS	X		30	07½							
	CH	eP	Y	18	29	34½							
		iS	Y		30	16½nw							
	Epicentre:			18	28	28	39.9S		174.4E		90km	NZ (C)	M 5.0 NZ
							Felt Central North Island and about Cook Strait. Max. MM3 at Ohakune.						
10	ON	P	E	13	27	30							
		e?	E		35	29							
	AK	eP	N	13	27	36							
		S	N		37	01							
	TU	P	N	13	27	47							
	TO	eiP	Z	13	27	35							
		eS	Z		37	12							
	NP	eP	E	13	27	38½							
	WN	iP	NZ	13	27	34							
		e	N		30	59							
	CB	P	E	13	27	25½							
		eS	E		36	43							
	KM	eP	X	13	27	25							
		eS	X		36	37½							
	CH	eP	Y	13	27	36							
		eS?	E		36	56							
	Epicentre:			13	16	04	3S		102E		150km	USCGS	
19	ON	eP?	E	09	31	35½							
		P	E			38e?							
		S	E		32	16							
		(S)	E			22½							
	KP	iP	N	09	31	16n							
		iS	N			41n							
	TU	iP	N	09	31	06s							
		i	N			15½							
		S	N			24½							
	TO	iP!	Z	09	31	22½u							
		e	Z			44½							
		e(S)	Z			57½							
	NP	eP	E	09	31	37½							
		eS	E		32	19							
	WN	eP	N	09	31	44							
		S	N		32	33½							
	CB	eP	E	09	31	59							
		S	E		33	00½							
	KM	eP	X	09	32	25							
		S	X		33	36½							
	CH	eS	Y	09	33	39							
	Epicentre:			09	30	40½	37.7S		178.2E		100km	NZ (C)	M 5.0 NZ
							Felt East Cape				MM3		
21	ON	eP	E	17	16	19½							
	Epicentre:			17	12	30	17½S		179E		600km	USCGS	
22	AK	S	N	03	52	03							
	KP	eP	N	03	50	30½							
		eS	N		52	13							
	TU	eP	N	03	50	32½							
		S	N		52	09½							
	WN	eP	NZ	03	51	02½							
		S	NZ		53	12							
	CB	eP	E	03	51	16							
		eS	E		53	25							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		
APR 22	KM	eP?	X	03	51	34½								
		eS	X		54	01½								
	Epicentre:			03	48	17	30.2S		177.0W		475km?		NZ (D)	
22	WN	eL			05	02	Tremors for 8 minutes							
	Epicentre:			04	40	53	6S		151½E				USCGS	
22	WN	eL	N	18	16									
	Epicentre:			17	21	53	54S		162W				USCGS	
23	KP	eP	N	03	44	28								
	CH	eL	NZ	04	18									
	Epicentre:			03	31	40	42½N		144½E				USCGS	M
25	KP	P	N	08	34	46½								
		eS	N		38	54½								
	TU	eP	N	08	34	53								
		eS	N		39	14								
	NP	eP?	E	08	34	49								
		e(P)	E		35	11								
		eL	E		40	21								
	TO	P	Z	08	34	57½u								
		eS?	Z		39	15								
	WN	P	NZ	08	35	16								
		e(L)	N		40									
	CB	eP	E	08	35	16½								
		eS	E		39	34½								
	KM	eP	X	08	35	36								
	Epicentre:			08	29	58	17S		175E				USCGS	M
25	KP	eP	N	08	43	42½								
		eS	N		47	56								
	TU	eP	N	08	44	03½								
	TO	eP	Z	08	44	02½								
	WN	P	NZ	08	44	15								
	CB	eP	E	08	44	16½								
		eS?	E		48	40½								
	KM	eP?	X	08	44	35½								
		eP	X			51½								
	Epicentre:			08	38	56	17S		175E				USCGS	
26	ON	eP	E	07	46	17								
		eS	E		49	53½								
		L	E		51									
		eScS?	E		55	52								
	AK	eP	N	07	46	(42)								
		e(S)	N		49	08								
		e(S)	N		50	25								
	KP	eP	N	07	46	39								
		eS	N		50	52½								
	TU	eP	N	07	46	46								
		e	N		47	13								
	NP	eS?	E	07	51	21								
	TO	P	Z	07	46	51								
	WN	P	NZ	07	47	08								
		eS	N		51	29								
		eL	N		52									
	CB	eP	E	07	47	10								
		eS	E		51	34								
	KM	eP?	X	07	47	15								
		e	X			42								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
APR 26	CH	eS	Z	07	51	50								M 6.5
		eS	E		52	11								
		eS	N			36								
		eL	N		55	08								
		eL	Z			47								
	Epicentre:			07	41	52	16½S		174E				USCGS	M 6 Pas
28	ON	P	E	14	56	02								
	AK	P	N	14	56	26								
		Sn)	N		57	25								
	KP	ePn	N	14	56	08½								
		P	N			25								
		(P)	N		57	04½								
		eSn	N			26								
		eS	N		58	30								
	TU	P	N	14	56	05								
		(S)	N		57	14½								
		Sn	N			17								
	NP	ePn?	E	14	56	37								
		eP	E			42								
		eSn	E		57	54								
		eS	E		58	20								
	WN	iPn	Z	14	56	41								
		P	Z		57	06								
		Sn	N		58	25								
		eS	N		59	23								
	CB	ePn	E	14	56	56½								
		eP	E		57	22½								
		eSn	E		58	43								
	CH	e(Pn)	Y	14	57	23½								
		eSn	Y		59	27½								
	KM	e(Pn)	X	14	57	25½								
		e(Sn)	X		59	21								
		Sn	X			27								
	Epicentre:			14	54	30	32.7S		178.3W		S		NZ (D)	M 6.0 NZ
				14	54	30	Kermadec Region						USCGS	
MAY 1	TU	e	N	11	10	35								
	TO	e	Z	11	10	24								
	WN	P	Z	11	09	36								
		e(S)	N		13	02								
	CB	eP	E	11	09	42								
	KM	eP	X	11	09	24								
1	WN	eP	Z	13	01	54								
		eS	NZ		04	59								
		e	NZ		05	03								
		eL	N		09									
	Epicentre:			12	57	48	Tonga region						USCGS	
2	TU	eS	N	16	54	49								
	TO	eP	Z	16	52	28								
	WN	iP	NZ	16	52	47								
		e	Z		55	28								
		iS	NZ			38								
		i	Z			42								
	CB	eP	E	16	52	52								
		eS	E		55	45								
	KM	eP	X	16	53	08								
		eS	X		56	19								
2	WN	P	NZ	23	16	42								
5	ON	eP	E	03	27	31								
	KP	eP	N	03	27	44								
	TU	eP	N	03	27	45								
		eS	N		32	10								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		
MAY 5	WN	P	NZ	03	28	12								
		iS	Z		33	09								
		eS	N			12								
	CB	eP	E	03	28	18								
	KM	eP	X	03	28.6									
		Epicentre:		03	22	27							15½S	173W
6	WN	eP	N	00	51	58							100km	USCGS
		iP	Z			59								
		e	N		55	20								
	CB	eP	E	00	52	20								
8	ON	P	E	12	50	49								
	KP	eP	N	12	50	04								
		e	N		53	50								
		e	N		54	11								
	TU	eP	N	12	51.1									
		eS	N		54	11								
8	WN	iP	NZ	12	51	33u								
		iS	NZ		55	08								
	CB	eP	E	12	51	37								
		eS	E		55	05								
	KM	eP	X	12	51	53								
		e	X			57								
		eS	X		55	39								
		Epicentre:		12	47	18							Fiji	
													400km	USCGS
15	ON	eS	E	10	58	58								
	KP	eS	N	10	59	19								
	TU	eS	N	10	58	57								
	WN	eS	N	11	00	03								
	CB	eS	E	11	00	31								
16	ON	eP	E	22	12	33								
	TU	eS	N	22	15	20								
	WN	eP	N	22	13	21								
		eS	N		16	21								
	CB	eP	E	22	13	24								
		Epicentre:		22	09	50							24S	178½E
													600km	USCGS
18	ON	eP	E	08	23	25								
	KP	eP	N	08	23.6									
	WN	eP	N	08	24	05								
		Epicentre:		08	19	35							17S	179W
													600km	USCGS
19	WN	eL	N	00	39									
	CH	eL	E	00	39									
		eL	NZ		40									
		Epicentre:		00	21	12							11½S	166½E
														USCGS
19	KP	eP	N	01	37	40								
	TU	eP	N	01	37	52								
	WN	iP	NZ	01	38	02								
		eL	N		50									
	CB	eP	E	01	37	54								
	KM	eP	X	01	38	01								
		Epicentre:		01	30	36							7S	156E
														USCGS
19	WN	iS	N	20	25	32					6	5		
		eSS?	N		32	31								
		eL	N		41½									
	AK	eL	N	20	45									
		Epicentre		20	02	15							40S	43E
														USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
MAY 21	WN	e	N	13	30	34								
21	ON	eS	E	22	52	47								
	AL	eL	N	22	45½									
	KP	eS	N	22	53.2									
	WN	eS	N	22	55	13½								
		eL	N		57.7									
	CB	eS	E	22	55	34								
	CH	eL	Z	22	59									
22	ON	eP	E	03	06	15½								
		e	E		07	04								
	KP	eP	N	03	06	29								
	NP	eP	E	03	06	50								
	WN	eP	N	03	06	57								
		eL	H		13	50								
		eL	H		15.4									
	CB	eP	E	03	07	03								
	KM	eP	X	03	07	18								
	CH	eL	NE	03	15									
		eL	Z		17						5	16	6 20	20 20
		Epicentre:		03	01	03							15½S	173W
														USCGS
22	ON	eS	E	11	42	18								
	KP	eS	N	11	43.4									
	WN	eS	N	11	44	18								
	CB	eS	E	11	44	40								
22	ON	eP	E	13	42	47								
		i	E			49¼								
		eS	E		48	02								
	KP	P	N	13	43	04								
		e	N		51	47								
	WN	iP	NZ	13	43	23d								
		i	N			25								
		i	N			29½								
		iS	N		49	02								
		e	N			08								
		iesS	N		52	00								
	CB	eP	E	13	43	16								
		eS	E		48	53								
	KM	eP	X	13	43	23								
		eS	X		49	04								
	CH	iP	NZ	13	43	31d								
		epP	NZ		45	21								
		e	Z		48	00								
		iS	E		49	21w								
		esS	NE		52	11								
		Epicentre:		13	36	12							4S	152½E
														550km USCGS
23	KP	iP	N	20	53	02½n								
		pP	N		54	13½								
		eS	N		56	44n								
		e	N			56								
		eSS	N		58	50								
		eScS	N	21	03¼									
	TU	eP	N	20	53	06n								
		epP	N		54	18								
		eS	N		56	49								
		e	N			57								
		eSS	N		58	48								
		eScS	N		03	24								
	TO	P	Z	20	53	10d								
		pP	Z		54	24								
		e	Z		57	14								
	NP	P	E	20	53	18								
		esP	E		55	20								
		e(PcP)E			56	35								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	
MAY 23	NP	eS	E		57	04							
		eSS	E		59	20							
	CB	P	E	20	53	33							
		epP	E		54	49							
		eS	E		57	33							
		eSS	E		59	54							
	WN	iP	NZ	20	53	30			50	4			
		i	N			32½							
		i	N			47							
		ipP	N		54	46			50	5			
		iS	N		57	19			50	9			
		i	N		59	18							
		eSS	N		59	54							
		iScS	N	21	03	37n			140	3			
	KM	P	X	20	53	47							
		epP	X		55	17							
		eS	X		58	03							
		eSS	X	21	00	28							
	CH	iP	NEZ	20	53	51½d	110	10	90	12	52	12	
		epP	Z		55	08	65	4					
		esP	Z		56	02	82	6					
		iS	E		58	10							
		eSS	X	21	00	41			140	15	80	15	
		iScS	X	21	03	50							
	Epicentre:			20	48	30	15½S		179W		450km		USCGS
23	ON	eP	E	21	56	42							
	KM	e	X	21	57¾								
	Epicentre:			21	52	26	Fiji				550km		USCGS
24	WN	e(P)	N	18	59	22							
		e(S)	N	19	01	44							
25	TU	e	N	07	12	25							
		e	N			42							
	WN	e	N	07	13	34							
25	ON	eP	E	12	15	10							
	KP	eP	N	12	15	21							
	TU	eP	N	12	15	08							
		eS	N		16	31							
	TO	eP	Z	12	15	39							
		e(S)	Z		17	17							
	WN	e(P)	NZ	12	15	55							
		eS	N		17	37							
	CB	eS	E	12	17	57							
	KM	eS	X	12	18	38							
	Epicentre:			12	13	20	33S		177W				NZ (D)
26	ON	P	E	20	25	02¾w							
		i	E			04w							
		i	E			07¼w							
		e	E		27	58							
		eS	E		28	11							
		e	E		31	45							
		ScS	E		35	25e							
	KP	P	N	20	25	16							
		i	N			19							
		e	N		27	54							
		eS	N		28	28							
		eScS	N		35	26							
	TU	eP	N	20	25	18							
		e	N			21							
		e	N		28	08							
		eS	N			24							
		e	N		35	25							
		ScS	N			28½n							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
MAY 26	TO	eP	Z	20	25	25								
		i	Z			27								
		e	Z		28	11								
		eScP	Z		31	47								
	NP	e(P)	E	20	25	34								
		e(S)	E		28	47								
	CB	eP	E	20	25	47								
		e	E			49								
		e	E		28	37								
		S	E		29	16								
		eScS	E		35	43								
26	WN	eP	ZN	20	25	42								
		eS	N		29	12					13	1		
		iScS	N		35	37					24	5		
	KM	eP	X	20	26	02								
		i	X			05								
		e(pP)	X		27	26								
		eS	X		29	43								
		iScS	X		35	45								
	CH	iP	Z	20	26	09					18	7		
		eP	N			10								
		e	N			13								
		e	EN		28	30					15	14	18 14	
		e	Z			37					31	15		
		eS	N		29	51					37	11	32 11	
		eScS	NE		35	55								
	Epicentre:			20	21	14	19S		178½W		550km		USCGS	M 6.6 CH
28	TU	eP	N	13	33	52								
	WN	eP	N	13	33	43								
	Epicentre:			13	23	20	1N		121½E		100km		USCGS	
29	ON	eP	E	06	37	47								
	KP	eS	N	06	39	32								
	TU	eS	N	06	39	31								
	TO	eS	Z	06	39	52								
	WN	eP	N	06	38	31								
		eS	N		40	33								
	CB	eS	E	06	40	47								
	KM	eS	X	06	41	23								
30	ON	P	E	15	45	11½								
		e	E			35								
		e	E		47	10								
		eS	E			52								
	KP	eP	N	15	45	28								
		eS	N		48	19								
	TU	e	N	15	48	21								
		eS	N			29								
	NP	eP	E	15	45	49								
	WN	eP	N	15	46	00								
		eS	N		49	18								
	CB	eP	E	15	46	05								
		eS	E		49	24								
	KM	eP	X	15	46	24								
		eS	X		49	.9								
	CH	eP	X	15	46	.5								
		eS	X		49	09								
	Epicentre:			15	41	57	23S		178½W		350km		USCGS	
31	KP	eP	N	21	05	02								
	CB	eS	E	21	08	39								
	Epicentre:			21	00	50	Fiji				60km		USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		
JUN 3	ON	eP	E	18	54	09								
	KP	eP?	N	18	54	13½								
		e(S)	N		55	49¼								
	TU	eP	N	18	54	06¼								
		S	N		55	28¼								
	WN	eS	N	18	56	36								
		eL	N		59	.3								
	CB	eS	E	18	56	55								
	KM	EP	X	18	55	33½								
		e	X		57	37								
		S	X			45								
	CH	eS	Y	18	57	42¾								
		(S)	Y			56½								
		L	NE		59	.5								
		eL	Z	19	00	.2								
	Epicentre:			18	52	09	32¼S	176W		N		NZ (D)		
4	WN	eL	N	08	00	ca								
	CH	eL	E	08	00	.4								
		eL	E		04	.0								
		eL	N		06	.2								
		eL	E		11	.2								
	Epicentre:			07	09	18	52N	170½W				USCGS		
4	ON	Pn	E	12	07	42								
		iP	E			51¼								
		i	E		08	33¾								
	AK	(P)	N	12	08	19								
		i(S)	N		09	30								
		L	N			37								
	KP	eP	N	12	07	54½								
		eP	N		08	28¾								
		S	N		09	19								
	TU	Pn	N	12	07	40½								
		Sn	N		09	03								
	NP	e	E	12	08	46½								
	WN	ePn	N	12	08	18½								
		Sn	N		10	11								
	CB	eP	E	12	09	06								
		eSn	E		10	30¼								
	KM	eP	X	12	09	03								
		eSn	X		11	09¾								
	CH	eSn	Y	12	11	16½								
		eL	E		12	30								
	Epicentre:			12	05	50	32.2S	177.1W		N		NZ (D)		
4	ON	e(P)	E	18	39	08								
		e(S)	E			53½								
	KP	e	N	18	40	31¾								
	TU	ePn	N	18	39	04½								
		Sn	N		40	27								
	WN	eSn	N	18	41	34¼								
	CB	eSn	E	18	41	53¾								
	KM	Sn	X	18	42	34¼								
	Epicentre:			18	37	19	32.4S	177.3W		70km?		NZ (D)		
5	ON	eP	E	02	47	03								
		e	E			25½								
	AK	e?	N	02	49	54								
	TU	eP	N	02	47	49								
		eS	N		48	46¼								
	WN	eS	N	02	49	54½								
	KM	es?	X	02	51	01								
	Epicentre:			02	46	.5ca	Kermadec Region					NZ (D)		

te	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
N 5	ON	eP	E	06	09	02½								
	KP	eP	N	06	08	55								
	WN	eS	N	06	15	37								M 6.4
		eL	N			20ca								
	KM	eP	X	06	09	10¼								
	CH	eP	Z	06	08	41								M 6.3
		eL	E			20ca								
		eL	Z			22ca								
		eL	N			22ca								
	Epicentre:			05	59	41	51S	112½W				USCGS		M6¼-6½ Pas
6	ON	eP	E	23	00	35¾								
	KP	eS?	N	23	02	08½								
	WN	e(S)	N	23	02	31								
		eL	N		04	.3								
	CB	eS	E	23	02	54½								
	KM	eS	X	23	03	34								
8	ON	eP	E	21	00	20¼								
		e	E			35¾								
		e(S)	E		01	07¾								
	AK	P	N	21	00	41								
		iS	N		01	50								
	KP	eP	N	21	00	39¾								
		S	N		01	48¾								
	TO	eP	Z	21	00	52½								
		S	Z		02	12								
	WN	eS	N	21	02	49								
		S	N			50½								
	CB	S	E	21	03	11¼								
	KM	eP	X	21	02	04								
		eS	X		03	52								
	CH	eS	Y	21	04	01½								
		eL	NE		05	.6								
	Epicentre:			20	59	12	33.3S	179.0W		350km		NZ (D)		M5.7 NZ
9	ON	eP	E	10	21	30½								
	TO	eP	Z	10	21	20								
	WN	P	Z	10	21	14½								
		e	N		41	ca								
		e(L)	N		48	.5								
	CH	P	Z	10	20	55½								
		e	Z		22	32								
		iS	NEZ		31	34								M 7.4
		SS	NE		37	44								
		eLq	E		43	.3								
		Lr	NEZ		48	.1								
	Epicentre:			10	08	32	30½S	70½W				USCGS		M 6¾
9	WN	e(PPP)	Z	23	37	12								
		eSKS	N		39	51								
		e(PS)	N		44	55								
		ePPS	N		46	02								
		eSS	N		51	30								
		e(SSS)	N		55	55								
		eL	N	00	06	ca								
	CB	ePKP	E	23	32	47½								
	KM	e(HKP)?	X	23	33	27								
	CH	PP	Z	23	34	28								
		eSKS	E		39	56								
		ePS	E		44	30								
		iPPS	NEZ		46	03								
		(SKKS)	Z		50	26								
		i(SS)	NE		52	00								
		(SSS)	N		55	45								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te			Mag.
JUN 9	CH	i(SSS)	E		56	23									
		eL	E	00	13	52									
		eL	Z		20	34									
	Epicentre:			23	13	51	35½N		67½E				USCGS		
12	AK	e	N	05	05	00									
	WN	e	N		07	ca									
12	CH	eL	NE	09	31	.1									
	Epicentre:			08	54	02	9S		110W				USCGS		
13	ON	eP	E	12	17	23¾									
	AK	e?	N	12	45	08									
	KP	eP	N	12	17	34¾									
	TU	eP	N	12	17	45¾									
	WN	eP	N	12	17	41									
		eL	N		38	.5									
	CB	eP	E	12	17	36½									
	KM	eP	X	12	17	35									
	Epicentre:			12	07	41	½S		124½E		200km		USCGS		
15	ON	P	E	15	38	34½									
		eS	E		41	45½									
		eL	E		44	52									
	AK	eP	N	15	39	00									
		eS	N		42	06									
		e(L)	N			40									
		i	N		46	03									
	KP	eP	N	15	38	52									
		eS	N		41	41									
	TO	eP	Z	15	37	36½									
	WN	e(S)	N	15	42	14									
		eL	N		43	.5									
	CH	eS	NE	15	44	50									
		e	Z		45	55									
	Epicentre:			15	35	47	300 miles S of Tonga						200km USCGS		
16	ON	eP	E	18	13	58									
	AK	e	N	18	14	33									
		eL	N		15	55									
	TU	eP	N	18	14	08									
		e	N			47									
		eS	N		15	27½									
		eL	N			48									
	TO	eP	Z	18	14	24½									
	WN	e(P)	N	18	15	39¼¾									
		eS	N		16	31¾									
	CB	e(P)	E	18	15	09½									
	CH	e(S)	Z	18	17	57									
		e	N		18	36									
		e	E		19	06									
		e	Z			41									
	Epicentre:			18	12	26	32.0S		178.8W		N		NZ (D)		
16	ON	eP	E	18	32	39½									
	AK	S	N	18	34	00									
		e(L)	N		35	00									
	TU	eP	N	18	32	50									
	TO	eP	Z	18	33	06									
	WN	eS	N	18	35	15½									
	CB	e(P)	E	18	33	52									

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te			Mag.
JUN 16	KM	e	X	18	35	28½									
	CH	eS?	Z	18	36	31									
	Epicentre:			18	31	03	31.8S		178.4W		N		NZ (D)		M 5.2 NZ
16	ON	P	E	18	33	50¾									
		e	E		35	53									
	AK	P?	N	18	34	00									
		e	N		35	00									
		i	N			41									
			N		36	37									
		i	N		37	44									
			N		38	52									
	TU	eP	N	18	34	03½									
		e	N			42									
		eS	N		35	26									
	TO	eP	Z	18	34	13½									
	WN	eS	N	18	36	23¼									
	CB	eP	E	18	34	52									
	KM	e	X	18	36	31									
	CH	e	Z	18	36	31									
		e	E		38	35									
		e	N			49									
		e	Z		39	54									
	Epicentre:			18	32	15	31.8S		178.4W		N		NZ (D)		M 5.5 NZ
16	ON	eP	E	19	39	05½									
	AK	e(S)	N	19	42	50									
	TU	e(S)	N	19	40	05									
	WN	eS	N	19	42	50									
	CH	eL	E	19	45	06									
		eL	N			34									
		eL	Z		47	07									
	Epicentre:			19	36	01	300 miles S of Tonga						USCGS		
17	ON	iP	E	03	03	09w									
		eS	E		04	23									
	KP	eP	N	03	03	18									
		eS	N		04	33									
	AK	P	N	03	03	12±2									
		S	N		04	30									
	TU	eP	N	03	03	16									
		S	N		04	34									
	WN	P	N	03	03	51¼									
		eS	N		05	39									
		iS	N			42¼¾									
		i	N			45½									
	CB	eP	E	03	04	09									
		e(S)	E		05	56									
		S	E			58½									
		L	E		06	00									
	KM	P	X	03	04	28¼¾									
		S	X		06	36½									
	Epicentre:			03	01	33	31.7S		179.0W		200km		NZ (D)		M 6.4 NZ
							Felt Dannevirke MM2.								
18	ON	P	E	04	14	58									
	KP	P	N	04	15	06½									
		e(s)	N		16	15½									
	TU	P	N	04	15	06									
		S	N		16	10									
	WN	iP	N	04	15	40½s									
		eS	N		17	11¾									
		iS	N			15¼									
	CB	eP	E	04	15	50									
		S	E		17	29									

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te
JUN 18	KM	eP	X	04	16	14						
		eS	X		18	06						
	Epicentre:			04	13	43½	33¼S	179¾W			N	NZ (D)
23	KP	e(SKS)	N	02	42	41						
	WN	e(SKS)	N	02	43	00						
		eLr	N		07	ca						
	CH	(SKS)	E	02	43	18						
		ePPS	NE	02	45	41						
		eSS	E	02	50	33						
		e(SS)	N			52						
		e(SKKS)	E		55	51						
		e(Lq)	E	03	00	.3						
		eLr	E		04	.7						
		eLr	N		05	.1						
	Epicentre:			02	18	02	56½N	163½E				USCGS
23	AK	P	N	23	22	32±2						
	ON	P	E	23	22	12						
	KP	eP	N	23	22	39¼						
	TU	eP	N	23	22	53						
	TO	P	Z	23	22	56						
	WN	eP	N	23	23	33						
	CB	eP	E	23	23	21½						
	KM	eP?	X	23	23	37						
		eP	X			43						
	CH	e?	N	23	24	22						
		eL	Z		29	40						
		eL	NE			53						
	Epicentre:			23	18	57	21S	174E				USCGS
24	ON	eP?	E	21	05	31						
	KP	eP	N	21	05	42						
	TO	eP	Z	21	05	53						
	WN	e(S)	N	21	14	42						
		eL	N		20	.5						
	CB	eP?	E	21	05	59						
		eP	E		06	07						
	KM	e	X	21	18	38						
	CH	e(L)	N	21	17	04						
	Epicentre:			20	58	36	7S	155E				USCGS
25	TO	e(P)	Z	12	45	54						
	WN	eL	N	12	51	ca						
	CH	eL	NE	12	49	28						
		eL	Z			50						
26	ON	P	E	13	48	41						
	TU	eS	N	13	49	47½						
	TO	eP	Z	13	49	04						
		eS	Z		50	15						
	WN	P	N	13	49	23¼						
		eS	N		50	50¾						
		S	N			52						
		i	N			54						
	CB	eS	E	13	51	09½						
	KM	eS	X	13	51	47						
	Epicentre:			13	47	31	34.0S	179.7E			150km	NZ (D)
28	ON	eS	E	04	04	44½						
		eL	E		05	15						
	AK	eL	N		09	.9						
	WN	eL	N		07	.4						
	Epicentre:			03	54	20	15½S	178W				USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
JUL 2	ON	P	E	17	25	34							
		e	E			53							
	KP	eP?	N	17	25	51							
		eS	N		27	00							
	TU	eP	N	17	25	42							
		e	N		26	51							
		eS	N			53							
	WN	eP	Z	17	26	16							
		eS	Z		28	03							
	CB	S	E	17	28	18							
	CH	e		17	29	05							
		eS				09							
	Epicentre:			17	24	.0	33½S	179W				NZ (D)	M 6 NZ
							Using additional data from Brisbane						
3	WN	e?	N	13	01	50							
		e(S)	N		05	55							
		eL	N		07								
	CH	eL	EN	13	04½								
		eL	Z		06								
4	ON	eP	E	00	43	41							
		i	E			45							
	KP	P	N	00	43	56							
		eS	N		47	19							
	TU	eP	N	00	43	59							
		eS?	N		47	18							
		eS	N			25							
	WN	iP	Z	00	44	25							
		eS	Z		48	15							
	CB	eP	E	00	44	28							
	KM	eP	X	00	44	43							
		e	X			58							
	SU	eP	N	00	41	09							
		S	N		42	05							
	Epicentre:			00	39	55	18S	178½W			450km	USCGS	
4	WN	eL	N	03	25								
	CH	eL	NEZ	03	25								
	Epicentre:			03	04	14	7S	155½E				USCGS	
4	WN	eL	N	04	05								
	Epicentre:			03	42	50	7S	155½E				USCGS	
4	WN	eL?	N	07	41								
	CH	eL	EN	07	40								
	Epicentre:			07	19	09	7S	155½E				USCGS	
4	ON	P	E	16	13	38							
		e	E		14	21							
		S	E		15	58w							
	AK	iS	N	16	16	30n							
	KP	eP	N	16	13	54							
		eS	N		16	25							
	TU	eP	N	16	13	59n							
		eS	N		16	36							
	WN	iP	NZ	16	14	29							
		iS	NZ		17	26							
	CB	eP	E	16	14	32							
		S			17	34							
	KM	eP	X	16	14	49							
	SU	eP	N	16	12	35							
		iS	N		13	55							
	Epicentre:			16	10	48	23½S	180			450km	USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		
JUL 4	AK	eL	N	23	48									
	WN	eL		23	49½									
	SU	e(P)	N	23	41	05								
		e	N			26								
		e	N			45								
		eL	N		43.1									
	Epicentre:			23	39	14	Loyalty Is.						USCGS	
9	ON	ePKP	E	03	31	47								
	AK	eL	N	04	14½									
	KP	ePKP	N	03	32	05								
	TU	ePKP	N	03	32.4									
	TO	PKP	Z	03	32	04								
		e	Z			24								
	WN	$ePKP_1$	Z	03	31	36								
		$ePKP_2$	N		32	03			3½	10				
		e	N		44	08			8	10				
		eSS	N		54	55			35	25				
		eSSS	N		59	40			26	25				
		eL	N	04	15									
	CH	$ePKP_1$	Z	03	31	40	22	10						
		$ePKP_2$	EZ		32	03	32	10			10	10		
		ePKS	Z		35	00								
		ePP	NEZ		35	29	41	18	9	18	19	18		
		eSKKS	E		42	14					22	22		
		i	EN		58	22			65	10	110	8		
	SU	ePKP	N	03	31	51								
		eSS	N		54	26								
		eSSS	N	04	00	35								
	Epicentre:			03	11	39	37N		26E				USCGS	
9	CH	eP?	X	03	29	(34)								
		eS	X		30	(14)								
	KM	e	X	03	29	22								
		eS	X			58								
	CB	eS	E	03	30	37								
	WN	e?	Z	03	30	04								
	Epicentre:			03	28.0		46½S		167½E				NZ (D)	
							Felt Southland and Foveaux Strait							
							Max. Centre Island MM4.							
9	CH	eL	N	10	53									
		eL	Z		54									
	Epicentre:			09	56	13	20N		73W		100km		USCGS	
10	SU	eL		10	15		Coda 10 min.							
10	SU	eL		10	21½		Coda 6 min.							
10	SU	eL		13	42		Coda 6 min.							
10	AK	eL	N	15	(20)									
	WN	eL	N	15	19½									
	CH	eL	E	15	19½									
		eL	Z		20									
	SU	eS	N	15	10	54								
		eL	N		12	17								
12	AK	eL	N	17	10									
	KP	eL	N	17	12									
	TU	eL	N	17	13									
	TO	eL	Z	17	15									
	WN	eL	N	17	09									
	CH	eL	EN	17	09									
		eL	Z		10									
	SU	eL	N	17	15	55								
13	SU	P	N	13	52	19n	No Surface Waves							
		S	N		53	16								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
JUL 16	WN	eL	N	16	09									
	CH	eL	NE	16	09									
17	ON	P	N	07	42	42								
		e	N		43	41								
		eS	N		49	35								
	AK	eP	N	07	42	(49)								
		e	N		44	00								
		iS	N		49	50s								
		iScS	N		51	55n								
		isS	N		52	34s								
	KP	eP	N	07	42	54								
		ePcP	N		43	56								
		e	N		44	45								
		eS	N		49	58								
		eScS	N		51	57								
	TU	eP	N	07	43	02								
		e	N			07								
		e	N			37								
		eS	N		50	12								
		eScS	N		52	04								
	TO	eP	Z	07	42	56								
		ePcP	Z		43	54								
		esP	Z		45	12								
	WN	iP	NZ	07	42	57u								
		epP	NZ		44	30								
		e	N		45	41								
		iS	NZ		50	03					12	8		
		eScS	N		51	59					7	10		
		esS	N		52	46					9	5		
	CB	eP	E	07	42	47								
		epP	E		44	22								
		e	E		45	14								
		eS	E		49	47								
		eScS	E		51	46								
		esS	E		52	24								
	KM	eP	X	07	42	50								
		epP	X		44	26								
		e(sP)	X		45	13								
		eS	X		49	44								
		e	X		50	55								
		e(sS)	X		52	21								
	CH	iP	Z	07	42	55½u					24	4		
		iS	EN		49	59					19	9	17	7
	SU	iP	N	07	42	38n								
		i	N		43	54n								
		i	N		45	41s								
		e	N		49	19n								
		iS	N		50	26s								
		i	N			38n								
		i	N		51	45s								
	Epicentre:			07	34	07	7S		126½E		450km		USCGS	M 6.4 WN 6.1 CH
18	TO	eP	Z	00	35	08								
	WN	e	N	00	41	04								
		eS	N			29								
		eL	N		48									
	CH	eL	NE	00	49									
		eL	Z		50									
	Epicentre:			00	27	27	5S		151E				USCGS	
18	ON	eP	N	05	22.2									
	AK	eL	N	05	27.5									
	KP	eP	N	05	22.5									
		eL	N		27¾									
	WN	e	N	05	27									
		eL	NZ		30.3									

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	
JUL 18	CH	eL	E	05	28½								
		eL	N		30½								
		eL	Z		31								
	SU	e(P)	N	05	20	40							
		S	N		22	13							
		eL	N			26							
	Epicentre:			05	18	23	21½S	170E					USCGS
18	ON	P	N	06	28	22							
		e	N		29	02							
		e	N		31	06							
		eS	N		35	33							
		eL	N		39	55							
	AK	e	N	06	28(34)		in time mark.						
		e	N		31	16							
		eS	N		35	34							
		eL	N		40.3								
	KP	eP	N	06	28	39							
		e	N		29	12							
		eS	N		35	49							
		eL	N		42								
	TU	eP	N	06	28	44							
		e	N		29	28							
		eS	N		36	12							
	NP	eP	E	06	28	38							
		eS	E		35	46							
	WN	iP	ZN	06	28	41d							
		e	Z		29	09							
		e	ZN			19							
		iS	NZ		36	04			12	3			
		i	N			32							
		e	N		39	06							
		eL	N		42								
	CB	eP	E	06	28	33							
		e	E		29	07							
		eS	E		35	47							
		eL	E		40.2								
	KM	eP	X	06	28	34							
		e	X		29	23							
		eS	X		35	52							
	CH	eP	Z	06	28	41		11	7				
		e	NEZ		29	12				46	20	37	20
		eS	NE		36	01							
	SU	P	N	06	28	12							
		S	N		35	20							
	Epicentre:			06	19	15	5S	130E					USCGS
21	ON	eP	N	15	24	33							
	AK	eP	N	15	24	48							
		eS	N		28	30							
		eL	N		31								
	KP	eP	N	15	25	04							
	TU	eP	N	15	25	26							
	TO	eP	Z	15	25	20							
	WN	P	Z	15	25	41							
		eS	Z		29	24							
		eL	Z		31½								
	CB	eP	E	15	25	40							
	KM	eP	X	15	26	05							
	SU	eP	N	15	23	15							
		S	N		24	36							
	Epicentre:			15	21	20	22½S	172½E					USCGS

ate	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
UL 23	ON	e	N	03	35	41							
		e	N			47							
	WN	P	NZ	03	36	26							
	SU	eS	N	03	33	46	No Surface Waves						
23	KP	eP	N	14	33	32							
	TU	eP	N	14	33	41							
	TO	P	Z	14	33	41							
	WN	P	Z	14	33	36							
		i	NZ			52	Prominent						
	CB	eP	E	14	33	42							
	CH	eP	X	14	33	54							
		eL	NE		48								
	Epicentre:			14	25	46	4½S	154E					USCGS
23	SU	eL	N	16	08	27	Coda lasting 10 min.						
23	WN	e(P)	Z	19	36	24							
		e	Z			34							
		e	Z		38	36							
		eL	Z		54								
	CH	eP	EZ	19	36	40							
		eS	NE		45	14							
		Lq	NE		52	28							
		eLr	Z		56								
	SU	eL	N	19	52.9								
	Epicentre:			19	25	58	24S	102W					USCGS
24	KP	eP	N	07	08	27							
	TU	eP	N	07	08	30							
	WN	eP	NZ	07	08	56							
	CB	eP	E	07	09	04							
	KM	eP	X	07	09	19							
	SU	P	N	07	05	31							
		e	N			38							
		e	N		06	18							
		(s)	N			48							
	Epicentre:			07	04	35	Tonga						USCGS
24	WN	eP	NZ	15	24	33							
25	WN	e	N	06	36		Traces						
	CH	eL	NE	06	35		Wave train lasting 10 min.						
	SU	eS	N	06	25	43							
		eL	N		27	40	Coda lasting 15 min.						
26	ON	P	E	17	51	28							
		iS	E		53	21w							
	KP	eP	N	17	51	14							
		S	N		53	50							
	TU	e(P)	N	17	51	48							
		S	N		53	49							
	TO	eP	Z	17	51	54							
		eS	Z		54	12							
	WN	eP	NZ	17	52	15					6	5	M 6.0
		eS	N		54	41							
		eS	NZ			45							
	KM	eP	X	17	52	39							
		eS	X		55	18							
	SU	eP	N	17	51	13							
		iS	N		53	00s							
	Epicentre:			17	49	12	27S	178E					650km USCGS
26	ON	P	E	18	06	27							
		iS	E		08	20w							
	KP	eP	N	18	06	14							
		eS	N		08	50s							
	TU	eS	N	18	08	49							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te			
JUL 26	TO	eP	Z	18	06	54									
		eS	Z		09	14									
	WN	iP	Z	18	07	14½u									
		eP	N			15									
		eS	Z		09	41									
		eS	N			44									
	KM	eP	X	18	07	38									
		eS	X		10	18									
	SU	eS		18	07	55									
27	SU	eL		00	17	52							Coda lasting 15 min.		
27	SU	eL		07	11.6										
27	SU	eP		09	02	30							No surface waves		
		eS				53									
27	ON	eP	E	16	15	49									
	WN	eL	N	16	23.3										
	CH	eL	NE	16	24										
	SU	eL		16	16.5										
28	ON	eP	E	02	08	47									
	KP	eP	N	02	09	05									
	TU	eP	N	02	09	16									
	WN	P	Z	02	09	24									
	KM	eP	X	02	09	28									
	Epicentre:			02	01	58							6S 154E	150km	USCGS
29	ON	eP	E	03	31	03									
		e	E			05									
	TU	P	N	03	30	58									
		S	N		32	14									
	WN	S	NZ	03	33	23									
	CB	eS	E		33.7										
30	SU	e(P)		08	58	19									
		e(S)				40									
30	SU	eL		17	42.5								Coda lasting 4 min.		
31	WU	eL		00	25								Coda lasting 5 min.		
31	ON	P	E	10	35	41									
		S	E		37	00									
	KP	eP	N	10	35	51									
		eS	N		37	18									
	TU	P	N	10	35	54									
		eS	N		37	16									
	WN	P	Z	10	36	24									
		eP	N			25									
		e	N			28									
		eS	N		38	16									
	CB	eS	E	10	38	24									
	KM	eS	X	10	39.0										
	Epicentre:			10	33	58							31½S 179½W	400km	NZ (D)
													Using additional data from Brisb		
													and Uppsala.		
31	ON	eP	E	20	37	05									
		eS	E			38									
		e	E			54									
	KP	P	N	20	36	50									
		iS	N		37	12½s									
	WN	P	NZ	20	37	21½									
		S	NZ		38	09									
	CB	eS	E	20	38	24									
	KM	e(P)	X	20	37	56									
		eS	X		39	02									
	CH	eS	X	20	39	12									
	Epicentre:			20	36	21							37.6S 176.5E	200km	NZ (C)

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te				Mag.
AUG 1	ON	eP	E	17	38	23										
	WN	P	Z	17	38	58										
	KM	eP	X	17	39	08½										
	CH	eL	E	17	48.8											
	SU	i(S)	N	17	36	45										
		eL	N		37	35										
	Epicentre:			17	32	57							14½S	173½W	Samoa	USCGS
1	CH	L	NEZ	19	59.8											
1	CH	eL	NEZ	20	06.0											
4	WN	eP	N	04	07	11										
		iP	Z	04	07	12										
4	WN	eL	N	10	09ca											
	CB	eP	E	09	56	50¾										
	CH	eL	E	10	05.5											
		e	N		06.3											
		eL	Z		08.0											
	SU	e	N	09	59	21										
		eS	N	10	01	08										
		i	N			35										
		eL	N		02	15										
	Epicentre:			09	49	02							5½S	150½E	250km	USCGS M6¼-6½ Pas
9	ON	eP	E	03	07	45										
		S	E		10	50½										
	KP	eP?	N	03	08	07½										
		eP	N			09½										
		eS	N		11	09½										
	TU	eS	N	03	11	17										
	WN	P	Z	03	08	36½										
		e	Z		11	30½										
		eS?	N		12	13½										
		S	N			17										
	KM	eP	X	03	08	58½										
		e?	X		11	58½										
		eS	X		12	37½										
	SU	P	N	03	05	24										
		iS!	N		06	15										
	Epicentre:			03	04	16							18½S	179E	500km	USCGS M 5.1 NZ
9	SU	eS	N	09	39	30										
		e(L)	N		41	04										
	Epicentre:			09	35	38							20S	168E		USCGS
9	AK	EL	N	15	35.0											
	CH	eS	NE		31	19										
		eL	NE		36.0											
	SU	Not recorded														
	Epicentre:			15	24	37							Fiji region(?)			USCGS
9	AK	eP	N	21	47	23										
		i	N			49										
		eS	N		48	51										
		eL	N		49.1											
	KP	eP?	N	21	47	30½										
		eP	N		34											
		e(S)	N		48	31										
		eL			49	14										
	TU	P	N	21	47	26										
		S	N		48	47½										
		e	N		49	29										

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	
AUG 9	NP	eP	E	21	48	23							
		e(S)	E		49	49½							
		e	E		50	19½							
	WN	S	NZ	21	49	53							
	Epicentre:			21	45	42	32.2S	178.1W			N		NZ (D)
				21	45	42	31½S	178W					USCGS
9	ON	iP!	E	23	05	21¾w							
		iS!	E		09	09¼w							
		eScS	E		16	04							
	AK	iP	N	23	05	27s							
		iS	N		09	(19)n							
	KP	eiP	N	23	05	32½n							
		iP	N			34s							
		S	N		09	25s							
	TU	P	N	23	05	35½							
		S	N		09	27¼							
	NP	P	E	23	05	49½							
		e	E		06	40							
		eS	E		09	45½							
	WN	iP	NZ	23	06	01½							
		e?	N		10	07							
		eS	NZ			16							
9	CH	iP	NEZ	23	06	30							
		ePP	NEZ		07	56							
		eS	NE	.	10	58							
		eSS	E		12	06							
		eL	NE			30							
	SU	iP	N	23	02	27							
		S	N		03	21							
	Epicentre:			23	00	42	15S	176W			250km		USCGS
10	SU	(P)	N	15	26	18							
		i	N			27							
		e(S)	N		27	45							
		L	N		28	23							
	Epicentre:			15	24	37	Fiji region						USCGS
12	ON	eP	E	00	29	43							
	KP	P	N	00	30	01½n							
		eS?	N		33	29¼							
		eS	N			36¼							
	WN	eP	NZ		30	32							
		e(S)	N		34	28							
		(S)	N			38½							
	CB	eP	E	00	30	40½							
		eS	E		34	41½							
	SU	iP	N	00	27	15							
		i(S)	N		28	08							
		e				25							
	Epicentre:			00	25	42	19S	176W			200km		USCGS
12	KP	eP	N	17	11	48							
	WN	eL	N	17	34	ca							
	CH	eL	NE	17	34	ca							
	SU	eP	N	17	10	35							
		ePPP	N		14	17							
		S	N		18	53							
		PPS	N		19	23							
		Lq	N		26	.2							
		eLr	N		30	.6							
		eL	N		51	.0							
	Epicentre:			16	59	33	34N	138E					USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
AUG 13	ON	eP	E	09	10	18								
		e	E			26								
		eL	E		13	03								
	AK	e(S)	N	09	12	57								
		eL	N		13	25								
		i	N		19	55								
	KP	eP?	N	09	11	11								
		eS?	N			28								
		e?	N			56								
	TU	eS	N	09	12	25								
	WN	eP	NZ	09	11	12								
		eS	NZ		13	36½								
		eL	N		14	.7								
	CB	eS	E	09	14	00								
	CH	eS	Y	09	14	45								
		eL	NE		15	.7								
		eL	Z		17	.5								
	SU	P	N	09	10	31								
		e(S)	N		12	35								
		L	N		13	09								
	Epicentre:			09	07	38	28½S	176W					USCGS	M 5.8 NZ
14	WN	i	N	03	12	51								
		e	N		18	05								
		eL	N		29	.3								
	CH	e	NE	03	12	30								
		e	Z		13	18								
		e	NE		17	30								
		e	E		21	15								
		eLq	E		23	.5								
		eLr	NEZ		27	54								
	SU	e	N	03	19	09								
		eL	N		40	.3								
14	ON	eP	E	11	49	35½								
		e(S)	E		50	44½								
	KP	eP	N	11	49	52								
		eS	N		51	08								
	TU	eP	N	11	49	39½								
		eS	N		50	54								
	WN	eP?	Z	11	50	21								
		eP	NZ			24								
		eS	NZ		52	01¾								
	CB	eS	E		52	21½								
	KM	eS	X		53	00½								
14	CH	eS	Y	11	53	08								
	SU	eP?	N	11	51	33								
		e(PP)	N			56								
		eL	N		55	.0								
	Epicentre:			11	48	04	32.4S	179.2W	h	N?	NZ (D)		M 5.4 NZ	
				11	47	53	Kermadec Is region				USCGS			
14	ON	eP	E	23	38	02								
		S	E		40	51½								
	KP	P	N	23	38	13								
		eS	N		41	18½								
	TU	eP?	N	23	38	27½								
		eS	N		41	10½								
	WN	P	NZ	23	38	41								
		eS	NZ		42	09								
	CB	eP	E	23	38	45½								
		eS?	E		42	06								
		eS	E			15								
	KM	eP?	X	23	38	(59)								
		eP	X		39	05								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		
AUG 14	SU	eP?	N	23	36	52								
		i(P)	N		37	05								
		e(S)	N		38	05								
		Epicentre:		23	34	33							19½S	179W	550km	USCGS
15	ON	eP	E	11	01	16								
	AK	iS	N	11	09	30n								
		iSiS	N		11	05n								
	KP	eP	N	11	01	25								
		eS	N		09	55½								
		ScS	N		11	12n								
	TU	eP	N	11	01	36¼								
		S	N		09	56½s								
	WN	iP	NZ	11	01	29½d								
		iS	N		09	46								
	CB	eP	E	11	01	20½								
		eS	E		09	33½								
		ScS	E		11	03½								
	KM	eP	X	11	01	24								
	CH	eP	Z	11	01	30								
		iS	E		09	46e								
		i(PS)	E		10	26e								
15	SU	eP	N	11	01	04								
		ePP	N		03	12								
		e	N		05	19								
		i	N			37								
		iS	N		08	49								
		e	N		09	20								
		i(ScS)	N		10	30								
		Epicentre:		10	51	19							½S	123E	150km	USCGS
15	WN	e	N	13	45½									
		eL	N		57½									
	CH	eL	NG	13	57.0									
	SU	S	N	13	32	00								
		e(PS)	N			30								
		eL	N		43.4									
		Epicentre:		13	12	10							46N	151E		USCGS
18	SU	eL	N	22	22.0									
19	ON	P	E	05	20	32								
		e	E			55½								
		eL	E		23	35								
	AK	eP?	N	05	20	30								
		eP	N			39								
		(S)	N		23	31								
		L	N		24	22								
	TU	eP	N	05	21	12								
	NP	eP?	E	05	21	17								
		e(P)	E			30								
		eL	E		24	55								
	WN	eP	N	05	21	46								
		e(s)	N		25	42								
		eL	N		26½									
	CB	eP	E	05	21	50								
		eL	E		26.3									
	KM	eP	X	05	22	18								
	CH	eL	NE	05	26.8									
	SU	P	N	05	19	30								
		i	N			39								
		(S)	N		20	42								
		L	N			59								
		Epicentre:		05	17	43							21½S	179W	150km	USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te			Mag.
AUG 19	ON	eP	E	08	53	03									
	TU	eS	N	08	56	40									
	NP	eP	E	08	53	38½									
		e	E			59									
	WN	eP?	N	08	53	50									
		eP	N			53									
		eS	N		57	39¾									
	CB	eP	E	08	53	57									
		eS	E		57	54½									
	KM	P	X	08	54	14									
		eS	X		58	30									
	SU	eP	N	08	50	35									
		iS	N		52	14									
		Epicentre:		08	48	57							20S	176W	100km	USCGS	M 5.9 NZ
20	WN	eL	N	06	23±											
	CH	eL	NE	06	23±											
		Epicentre:		05	33	47							7½N	80W		USCGS	
21	SU	i(S)	N	02	34	38										
22	SU	eP	N	11	28	32½										
		e				51										
		iS	N		30	18										
		Epicentre:		11	26	06							New Hebrides			USCGS	
23	WN	eL	N	14	36ca											
		Epicentre:		13	48	30							15S	68W	100km	USCGS	M 6¼± Pas
24	WN	e(SKS)	N	04	51	55										
		eL	N	05	11½±											
	CH	eSKS	N	04	51	26										
		e(S)	E		52	28										
		PS	NE		53	39										
		eLr	NE	05	11.5											
	SU	ePP	N	04	41	13										
		iS	N		48	05										
		iPS	N			35										
		ePPS	N			50										
		i	N		49	45										
		e(SS)	N		52	01										
		eLr	N		59.6											
		Epicentre:		04	27	33							53N	172½E		USCGS	M 6½ Pas, Berk.
24	KP	eP	N	08	32	10										
	WN	eP	Z	08	32	35										
		i	Z			46½										
		eL	N		40.2											
	CH	e(L)	E		39.5											
		eL	NE		41.0											
	SU	eP?	N	08	29	35										
		i	N		30	32										
		S	N		32	07										
		e	N			47										
		L	N		34	10										
		Epicentre:		08	27	42							21S	169E		USCGS	
25	ON	eP?	E	07	32	26										
		P	E			27										
		S?	E			56½										
		e(S)	E		33	10½										
	KP	eP?	N	07	32	15½										
		P	N			16¼										

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
AUG 25	KP	iS	N			42½							
	TU	P	N	07	32	17½							
		iS	N			44¾							
	WN	P	Z	07	32	45½							
		S	Z			33 37							
	CB	S	E	07	33	50							
	KM	iS	X	07	34	30							
	CH	S	Y	07	34	37							
	Epicentre:			07	31	41	37.4S	177.0E			225km	NZ (D)	M 5
25	SU	(P)			15	01ca							
		e(S)				01 30							
26	AK	e	N	08	56	50							
		i?	N			57 45							
		e?	N	09	00	10							
	WN	e	N	08	58ca								
	CH	eL	E	08	58.3								
	SU	eL	N	08	50ca								
28	ON	iP	E	09	52	06w							
	KP	eP	N	09	52	24¼							
		eS	N		55	02							
	TU	eP	N		52	25¾							
		eS	N		55	01¼							
	WN	iP	NZ	09	52	53u							
		iS	NZ		55	52½							
	CB	eP	E	09	52	56							
		eS	E		55	26¾							
	KM	eP	X	09	53	12¾							
		eS	X		56	24½							
	SU	eP	N	09	50	48							
		iS	N		52	02							
	Epicentre:			09	49	13	23½S	180			600km	USCGS	M
SEP 2	ON	eP	E	14	28	02							
	KP	P	N	14	28	16n							
		eS	N		31	13							
	TU	eP	N	14	28	17							
		e	N		31	07							
		eS	N			10							
	NP	eP	E	14	28	36							
	WN	eP	Z	14	28	48							
		i	NZ			50u							
		e	Z		29	52							
		eS	N		32	05							
		eS	N			08							
	CB	eP	E	14	28	54							
	KM	eP	X	14	29	13							
		eS	X		32	47							
	Epicentre:			14	24	47	22½S	178½W			300km	USCGS	
3	KP	eP	N	18	09	57							
	WN	eP	N	18	10	30							
	CB	eP	E	18	10	24							
	KM	eP	X	18	10.7								
	Epicentre:			18	05	11	17½S	163½E				USCGS	
6	SU	eS	N	08	49	24	No Surface Waves						
	Epicentre:			08	47	10	Tonga region					USCGS	
6	SU	eP	N	13	14	55	No Surface Waves						
		e(S)	N		15	21							
7	ON	eP	E	03	58	25							
	KP	eP	N	03	58	39							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 7	WN	eP	N	03	59.0								
	CB	eP	E	03	59	19							
	KM	eP	X	03	59	29							
	SU	P	N	03	55	47							
		eS	N		56	43							
	Epicentre:			03	54	18	18S	176½W			250km	USCGS	
9	ON	P	E	01	34	50							
	KP	eP	N	01	34	58							
		eS	N		36	18							
	TU	eP	N	01	34	52							
		eS	N		36	04							
	WN	iS	NZ	01	37	09							
	CB	eS	E	01	37(35)								
	KM	eS	X	01	38	10							
	Epicentre:			01	33	18	33¾S	178W	h	N?		NZ (D)	M 5.5 NZ
9	KP	eP	N	15	25	25							
	TU	eP	N	15	25	23							
	WN	iP	NZ	15	26	15							
	KM	eP	X	15	26.8								
	Epicentre:			15	19	44	Fiji				550km	USCGS	
9	WN	e	N	18	10								
	CH	eL	EN	18	10								
	Epicentre:			17	35	13:	3N		129E		150km	USCGS	
10	AK	eL	N	02	23								
	WN	e	N	02	20	51							
		e(SS)	N		22	27							
		eL	N		23.7								
	CH	eL	ENZ	02	22								
	SU	eL	N	02	30								
10	WN	eL	N	14	51								
	CH	eL	EN	14	50								
	CH	eL	Z	14	51								
	Epicentre:			14	04	45	11½N	103½W				USCGS	
10	WN	e(P)	NZ	15	16	09							
10	ON	eP	E	23	55.1								
		eL	E		59								
	AK	eL	N	23	58½								
	KP	eL	N	23	58½								
	TU	eS	N	23	57	36							
	WN	eP	NZ	23	55	52							
		e	N		59	45							
		eL	N	00	00.5								
	CH	eL	NEZ	00	03								
	SU	iP	N	23	54	11n							
		eL	N		56	50							
	Epicentre:			23	51	44	25½S	175½W				USCGS	
10	SU	eL	N	23	59								
	SU	iP		02	33	05n							
11	ON	eP	E	02	37	05							
		eL	E		41								
	KP	eP	N	02	37	26							
		eS	N		41	32							
	TU	eP	N	02	37.7								
	WN	iP	NZ	02	37	56u							
		e(S)	N		42	16							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	
SEP 11	CB	eP	E	02	37	58							
	KM	eP	X	02	38	20							
	CH	eL	NEZ	02	44½								
	Epicentre:			02	32	28	16½S	178E					USCGS

Felt extensively in Fiji. Max MM Dreketi on NW. coast of Vanua Levu also Rabi MM2, Labasa (N. coast of Vanua Levu) MM2, Levuka MM1, at Nalawa on the SW coast of Vanua Levu in the Ovalau Is.

11	SU	eL	N	03	42½		
11	SU	eP	N	04	48	48	Felt Dreketi, Fiji
		S	N		49	13	
11	SU	eP	N	08	37	29	Felt Dreketi, Fiji
		eS	N			54	
11	SU	eP	N	13	34	32	
		S	N		35	37	
11	ON	eP	E	15	48¾		
		eL	E		55		
	KP	eP	N	15	48	55	
		eL	N		57		
	TU	eP	N	15	49.1		
	WN	iP	NZ	15	49	28d	
		e(S)	N		53	37	
	CB	eP	E	15	49	26	
	CH	eL	N	15	54		
		eL	E		55		
		Lmax			58		
	SU	eP	N	15	46	13	
		L	N		48	06	
	Epicentre:			15	44	04	17S 169E USCGS
11	WN	e	N	20	52	45	
	SU	P	N	20	43	09	
		eL	N		45.5		
11	WN	eL	N	21	46		
	CH	eL	N	21	50		
	SU	eL	N	21	36		
11	SU	eL	N	22	09.1		
12	SU	eP?	N	06	20	30	
		S				58	
13	SU	eP	N	12	04	18	
		S	N			41	
13	WN	eL	N	14	45.0		
	CH	eL	NE	14	41		
	SU	eL	N	14	52		
	Epicentre:			14	30	20	500 miles S. of Tasmania USCGS
13	WN	eL	N	18	57.2		
	CH	eL	E	18	58		
	SU	eP	N	18	45	57	
		e	N		46	08	
		iS	N		47	41	
	Epicentre:			18	43	49	New Hebrides Is. USCGS
13	SU	eL	N	21	49	16	
15	TU	eP	N	10	40	32	
	WN	iP	NZ	10	40	37u	
	CB	eP	E	10	40	30	
	KP	eP	N	10	40	19	
	Epicentre:			10	33	09	4S 151E 400km USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 15	WN	eL	N	16	40								
	CH	eL	N	16	40								
	Epicentre:			16	26	30	New Hebrides						USCGS
16	CH	eL	NE	09	41								
		eL	Z		44								
	Epicentre:			08	37	22	34N	69½E					USCGS
16	ON	eP	E	13	30	55							
		eS	E	13	34	28							
	AK	eS	N	13	34	40							
	KP	eP	N	13	31	08							
		eS	N	13	34	48							
	WN	eP	N	13	31	44							
		eS	N		35	41							
	KM	eP	X	13	31	58							
	Epicentre			13	26	30	19S	174½W			200km		USCGS
16	SU	eL	N	16	31								
20	WN	e	N	03	55±								
20	WN	eL	N	22	39.8								
	Epicentre:			21	52	01	51½N	159½E					USCGS
21	SU	eL	N	03	41								
22	KP	eP	N	06	56	45							
	TU	eS	N	06	59	26							
	WN	iP	NZ	06	57	11d							
		eS	NZ	07	00	12							
	SU	eP	N	06	54	57							
		iS	N		56	02n							
	Epicentre:			06	53	20	22½S	179½W			650km		USCGS
24	ON	eP	E	06	09	53							
	AK	eL	N	06	14								
	WN	eL	N	06	18¾								
	CH	eL	EN	06	19								
		eL	Z	06	21								
	SU	eP	N	06	06	50							
		eS	N		08	35							
	Epicentre:			06	04	37	15½S	173½W					USCGS
24	ON	P	E	07	05	31							
		e	E		08.4								
	AK	P	N	07	05	(43)							
		eL	N		11								
	KP	eP	N	07	05	59							
		eS	N		09	14							
		eL	N		10	03							
	TU	eP	N	07	06	14							
		eS	N		09	26							
	WN	iP	ZN	07	06	39d					6	5	
		eS	N		10	13					12	10	
		eS	NZ			17							
		eL	N		12						70	25	M 6.2
	CB	eP	E	07	06	39							
		eS	E		10	18							
		eL	E		12½								
	KM	eP	X	07	07	01							
	CH	eP	X	07	07	10							
		eS	NE		11	10					10	15	10 15
		L	NE		14						26	15	40 15 M 5.9

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
SEP 24	SU	P	N	07	03	31s							
		S	N		04	30							
	Epicentre:			07	02	13	22S		175E			USCGS	
25	ON	P	E	02	02	22							
		eS	E		03	29							
	TU	eP	N	02	02	25							
		eS	N		03	35							
	WN	eS	N	02	04	43							
	CB	eS	E	02	05.0								
	Epicentre:			02	00	54	34S		178¾W	h	N?	NZ (D)	
26	SU	eP	N	05	29	32							
27	SU	e(S)	N	10	48	05							
		e	N			55							
27	SU	eL	N	12	43	55							
29	WN	P	Z	09	16	28							
		eL	N		42								
	CH	eL	NEZ	09	52								
	Epicentre:			09	03	37	7½N		94½E			USCGS	
29	WN	iP	ZN	23	33	12d							
		e	N		37	10							
	CB	eP	E	23	33	09							
	KM	eP	X	23	33.4								
	Epicentre:			23	20	52	35½N		140E			USCGS	
30	TU	eP	N	14	51	49							
	TO	eP	Z			47							
	WN	iP	ZN	14	51	45d							
	CB	eP	E	14	51	49							
	KM	eP	X	14	51	56							
	Epicentre:			14	41	44	14N		144E		100km	USCGS	
OCT 2	WN	eL	N	15	40ca								
	Epicentre:			14	56	26	53N		159E		60km	USCGS	
3	WN	eS	N	14	56	12½							
	CB	eP	E	14	54	27							
		eS	E		55	56							
	KM	eP	X	14	54	05½							
		e?	X			56							
		eS	X		55	13							
		e	X			27½							
	CH	eP	Y	14	54	20							
		eS	YZ		55	36							
	Epicentre:			14	52	32	47.3S		164.7E		N	NZ (D)	
5	SU	eP	N	21	46	19							
		eS	N		48	30							
	Epicentre:			21	43	16	14S		167½E		100km	USCGS	
6	SU	eP	N	17	02	28							
		eS	N		03	26							
	Epicentre:			17	00	14	16S		179W		100km	USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 7	ON	eP	E	19	38	31							
	KP	eP	N	19	38	43½							
	SU	iP	N	19	36	04							
		iS	N		37	15							
	Epicentre:			19	34	34	19S		177W		200km	USCGS	
7	SU	eP	N	21	30	55							
		i	N		32	13							
		eS	N		33	15							
	ON	eP	E	21	33	00							
		e	E		33	13							
	KP	eP	N	21	33	31							
	WN	e	N	21	34	53							
		e	N		40	23							
		eL	N		43.6								
	Epicentre			21	27	30	13S		167E		100km	USCGS	
8	KP	eP	N	00	27	50							
	WN	iP	NZ	00	28	03u							
		eS	N		34	36							
	CB	eP	E	00	27	56							
		eS	E		34	24							
	KM	eP	X	00	27	58							
		eS	X		34	28							
	Epicentre:			00	19	47	4S		144½W		100km	USCGS	
8	WN	P	Z	04	39	25							
	Epicentre:			04	29	21	12½N		142E		150km	USCGS	
8	SU	iP	N	14	57	50							
		e(PP)	N		58	37							
		iS	N		59	53							
		eL	N		60.5								
	ON	eP	E	15	00	12							
		eS?	E		03	45½							
		e(S)	E		04	12							
		eL	E		04.8								
	AK	eP	N	15	00	08							
		iS	N		03	50							
		eL?	N		06.1								
	KP	eP	N	15	00	21							
		S	N		04	05							
		eL	N		05.4								
	WN	eP	Z	15	00	56							
		i	Z		01	08							
		eS	N		05	00							
		eL	NZ		07.5								
	CB	eP	E	15	01	09							
		eS	E		05	17½							
	KM	eP	X	15	01	25½							
		eS	X		05(56)								
	CH	eP?	Z	15	01	14							
		eS	NE		05	50							
		eL	E		08±								
		eL	NZ		09±								
	Epicentre:			14	55	52	19½S		174½W			USCGS	
	SU	iS											
9	WN	eL	N	06	32.0								
	CB	eP	E	06	24	53½							
	KM	eP	X	06	25	11							
		eS	X		29	27							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 9	CH	eL	E			31.7							
		eL	N			32.4							
	Epicentre:			06	19	37	19½S	174W				USCGS	
9	WN	e	N	10	28	4							
	CH	e	E	10	26	±							
11	SU	P	N	02	35	28							
		iPcP	N			55							
		e(PcS)	N		40	28							
		eS?	N		44	14							
		S	N			24							
		iPS	N		45	00							
		ePPS	N			25							
		i(ScS)	N			50							
		i?	N		47	58							
		eSSS	N		50	00							
		Lq	N		53	04							
		Lr	N		56	.0							
	AK	eP	N	02	38	10							
		eSKS?	N		45	00							
		(S)	N			15							
		i(PS)	N		46	08							
		e	N		48	00							
		eL	N	03	01	57							
	KP	eP	N	02	37	03							
		e(pP)	N			44							
		ePP	N		40	12½							
		(SKS)	N		47	24½							
		eS	N		48	12							
		eL	N	03	04	.5							
	WN	iP	NZ	02	37	24							
		epP	NZ			51							
		e	NZ			59							
		ePP?	N		40	59							
		iSKS	N		47	40							
		eLq	N	03	02	ca							
	CB	eP	E	02	37	20½							
		i	E			23½							
		epP	E		56								
		ePP?	E		40	08							
		e	E			58							
		eSKS	E		47	16							
		eS	E			54							
	KM	P	X	02	37	27							
		i	X			42							
		e(PP)	X		38	07							
		eSKS	X		47	44½							
		eS	X		48	15½							
	CH	P?	Y	02	37	52							
		e	Y		38	03							
		i?	Y			30							
	Epicentre:			02	24	33	46N	150½E		100km		USCGS	M7¼-½
11	WN	eLq	N	17	29	±							
	Epicentre:			16	48	46	40½N	126½W				USCGS	M 6
12	WN	eL	N	03	19	±							
	Epicentre:			02	37	43	15S	74½W				USCGS	M 6
12	WN	eL	N	13	08	±							
	CH	eL	N	13	11	½							
	Epicentre:			12	22	48	42½N	144½E				USCGS	M 6

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 12	ON	eP	E	18	44	36							
	KP	eP	N	18	44	59							
	WN	eP	NZ	18	45	28							
	CB	eP	E	18	45	27							
	Epicentre:			18	40	34	New Hebrides			200km		USCGS	
13	KP	eP?	N	19	01	40							
	WN	iP	NZ	19	01	40u							
		eS	N		07	50							
		e(SS)	N		11	18							
	CB	eP	E	19	01	52							
	KM	eP	X	19	02	03							
	Epicentre:			18	54	06	5S	149½E		150km		USCGS	
14	SU	eS	N	21	10	03							
		eL				10.6							
	ON	e(P)	E	21	09	41							
	WN	eL	N	21	16	±							
15	ON	P	E	03	49	49½							
		S	E		50	39							
	KP	P	N	03	49	25½							
		S	N		50	54½							
	NP	P	E	03	49	45							
		e	E		50	29							
		S	E			30½							
	WN	P	Z	03	49	48							
		eiS	N		50	38							
	CB	eP	E	03	50	02½							
		eS	E		51	05½							
		i	E			07							
	KM	eP	X	03	50	25							
		iS	X		51	42½							
	CH	eS	Y	03	51	41							
	Epicentre:			03	48	45	38.4S	178.7E		N		NZ (C)	M 5¼ NZ
18	ON	iP	E	04	30	12							
		eS	E		31	20							
	KP	P	N	04	30	21							
		eS	N		31	35¾							
	WN	eP?	Z	04	30	52½							
		iP	NZ			54							
		S	N		32	38½							
	CB	eP?	E	04	31	01½							
		e	E			09½							
		eS	E		32	50							
	KM	eP	X	04	31	24½							
		S	X		33	26							
	CH	eS	Y	04	33	35							
	Epicentre:			04	28	43	31¾S	179E		450km		NZ (D)	M 5 NZ
18	SU	eS	N	17	30	35							
	ON	eP	E	17	27	50							
	WN	e	N	17	35	±							
	CH	eL	E	17	36	½							
18	ON	eP	E	18	07	40½							
	CH	eL	E	18	16	.3							
19	KP	eP	N	10	57	49							
	WN	iP	Z	10	58	09							
	CB	eP	E	10	58	01							
	KM	eP	X	10	58	13							
	CH	eP	Y	10	58	17½							
	Epicentre:			10	50	29	5S	154½E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 19	SU	iP	N	12	02	06s							
		iS	N		03	15n							
	ON	eP	E	12	04	00							
		eS	E		06	36½							
		eScS	E		14	11							
	AK	Recorded but no timing											
	KP	eP	N	12	04	14							
		e	N		06	40							
		eS	N		07	15							
	NP	eP	E	12	04	33							
	WN	iP	Z	12	04	42u							
		P	N			42							
		e	N			47							
		S	Z		07	52							
		eS	N			53							
		i	Z		11	02							
		ScS	N		14	45							
	CB	eP	E	12	04	45							
		eS	E		07	58							
		eScS	E		14	42							
	KM	eP	X	12	05	00							
		eS	X		08	28							
		ScS	X		14	49							
	CH	eP	Y	12	05	12							
		eS	Y		08	42							
	Epicentre:			12	00	38	21S		179W		650km	USCGS	M 6
19	SU	e(L)	N	14	32.2								
	KP	eP	N	14	13	49							
		eS	N		20	32							
	WN	iP	Z	14	13	36u							
		e	Z		14	19							
		ePP	NZ		15	12							
		iS	N		19	59							
		eLq	N		23.0								
		eLr	Z		25								
	CH	eP	Z	14	13	34							
		eS	NE		19	57							
		Lq	E		23.2								
		Lr	NEZ		25.0								
	Epicentre:			14	05	34	56½S		122W			USCGS	M 5½
19	WN	e(S)	N	21	12	31							
		eL	N		27±								
	CH	e(S)	E	21	12	26							
		SS	NE		16	42							
		eL	NE		27ca								
	Epicentre:			20	47	33	52N		177E			USCGS	M 6
20	ON	P	E	06	33	56							
		i	E		34	06							
		e?	E			23							
	KP	eP	N	06	34	09½							
		e	N			43½							
	WN	eP	Z	06	34	28							
		eS	Z		37	06½							
		eL	N		40								
	CB	eP	E	06	35	03							
		eS	E		37	22½							
	KM	eP	X		35	17							
		eS	X		37	59½							
20	WN	eL	N	11	11	43							
	CH	eL	NE	11	44.7								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
OCT 22	ON	eL	E	12	51.5								
	AK	eL	N	12.8±									
	KP	eL	N	12	53.0								
		eL	N		54.6								
	WN	eP	Z	12	42	38							
		ePP	NZ		44	14							
		e	N		48	04							
		eSS	N		51	26							
		eLq	N		53								
		eLr	Z		55								
	CB	eL	E	12	55.5								
	KM	eL	X	12	54.6								
	Epicentre:			12	35	10	9½S		150E			USCGS	
22	WN	eL	N	15	41ca								
	Epicentre:			15	18	13	9½S		150E		150km	USCGS	
23	ON	eP?	E	07	58	16							
		eP	E			20							
		e(S)	E		59	56½							May belong to following earthquake.
		e(S)	E	08	00	05							
	KP	eS	N	07	59	47½							
	TU	eS	N	07	59	48½							
	WN	eS	N	08	00	49							
		i	NZ			52½							
	CB	eS	E	08	01	12½							
	KM	eS	X	08	01	50							
23	ON	e(P)?	E	07	59	56½							
		e(P)	E	08	00	05							
	KP	eS	N	08	01	21½							
	TU	S	N	08	01	16							
	WN	S	N	08	02	25							
	CB	eS	E	08	02	45½							
	KM	eS	X	08	03	26							
23	ON	EP?	E	08	52	36							
	KP	eP	N	08	53	05½							
	WN	e(S)	N	09	02	40							
		eL	N		12								
	KM	eP	X	08	52	48½							
23	ON	eP	E	10	06	11½							
		eS?			09	56							
	KP	eP	N	10	06	26½							
	TU	eS	N	10	10	12½							
	WN	eL	N	10	14.1								
	CB	eP	E	10	07	08							
	KM	eP	X	10	07	28							
		eS	X	10	11	50½							
	Epicentre:			10	01	48	19S		174W			Tonga	
24	WN	ePP	Z	15	00.7								
		eSKS	N		06	50							
		eSS	N		15	12							
		eLq	N		25.5								
		eLr	NZ		31								
	CH	ePP	EZ	15	01	06							
		SKS	NE		07	06							
		SKS?	E			46							
		iSP	Z		10	04							
		iPS	E			08							
		iPPS	EZ		11	12							
		e(PKKP)	E		12	15							
		SS	NEZ		16	00							
		(SSS)	NE		20	06							
		e(SKKKS)	EZ		23	16							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
OCT 24	CH	eLq	N			26.4								
		Lr	E			30.0								
	Epicentre:			14	42	11	12N	87W					USCGS	M 7½
25	WN	eL	N	06	10±									
		eL	Z		11±									
	CH	eL	NEZ	06	11¾									
	Epicentre:			05	21	40	12N	87W					USCGS	M6¼-½ (b
25	SU	e(S)	N	19	06	42								
		eL	N		07.7									
	Epicentre			19	04	04	17½S	175W						
26	SU	iP	N	02	47	38s								
		iS	N		48	09n								
	ON	eP	E	02	51	24								
	AK	eS	N	02	55	20								
	KP	eP	N	02	51	41½								
	WN	eP	Z	02	52	13								
		e	Z		53	26								
		eL	N		59.5									
	CB	eP	E	02	52	16								
	KM	eP	X	02	52	32								
	CH	eLr	NZ	03	01.4									
	Epicentre:			02	47	00	17½S	176E					USCGS	
26	SU	eP	N	08	57	53								
		iS	N		58	50								
	ON	eP	E	09	00	12								
		e	E		01	13½								
		eS	E		03	09								
	KP	eP	N	09	00	29								
		eS	E	09	00	40½								
	NP	eP	E	09	00	44½								
	WN	P	Z	09	00	56½								
		eP	N			57								
		e	N		01	10								
		e	Z			14								
		e	Z		04	22								
		eS	N		04	31								
		eS	Z			34								
		eL	N		12ca									
	CB	eP	E	09	00	54								
		eS	E		04	16								
	Epicentre:			08	56	30	21S	178W				350km	USCGS	
NOV 3	KP	eP	N	18	05	13								
		S	N		07	44								
	TU	eP	N	18	05	19								
		S	N		07	45								
	TO	eP	Z	18	05	22								
		eS	Z		08	02								
	NP	eS	E	18	08	11								
	WN	iP	NZ	18	05	42u			16	4				
		eS	NZ		08	33								
		iScS	NZ		16	23			4	5				
	CB	eP	E	18	05	46								
		e	E		08	40								
		S	E			45								
	KM	eP	X	18	06	03								
		eS	X		09	05								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
NOV 3	CH	eS	NE	18	09	17								
		eScS	NE		16	33								
	SU	eP	N	18	03	46			6	10	9	8		
		iS	N		05	11s								
	Epicentre:			18	02	04	24S	180				500km	USCGS	M 5.9 WN
4	AK	eP	N	07	09	53								
	KP	eP	N	07	09	54								
		eS	N		12	57								
		e	N		13	08								
		esS	N			22								
	TU	eP	N	07	09	47								
		eS	N		12	49								
	TO	eS	Z	07	13	29								
	WN	eP	NZ	07	10	24								
		eS	NZ		13	58			3	2				
		eL	N		15.2									
		iScS	NZ		21	51n			12	7				
	CB	eP	E	07	10	34								
		eS	E		14	11								
	KM	eP	X	07	10.9									
		eS	X		14	54								
	CH	iS	NE	07	14	59			17	10	18	14		
		L	NE		16	43								
	SU	iP	N	07	07	33								
	Epicentre:			07	05	51	20½S	176½W				100km	USCGS	M 6.5 WN 6.6 CH
6	WN	eL	N	00	12¾									
	CH	eL	NZ	00	15									
	SU	iP	N	00	05	12								
		eS	N		06	29								
		eL	N		07	07								
	Epicentre:			00	03	15	Tonga						USCGS	
6	WN	eL	N	14	36¼									
	CH	eL	ENZ	14	40									
	Epicentre:			14	12	30	5½S	132½E					USCGS	
7	WN	iP	NZ	03	11	17u								
	Epicentre:			03	06	51	17½S	178½W				600km	USCGS	
7	WN	iP	NZ	04	33	34u								
7	WN	e	N	15	30.4									
	SU	eL	N	15	25									
8	ON	P	E	03	48	41								
		eS	E		51	00								
	KP	eP	N	03	48	58								
		eS	N		51	31								
	TO	eP	Z	03	49	09								
		i	Z		50	25								
	WN	iP	Z	03	49	28								
		esP	Z		51	20								
		eS	N		52	20								
		eS	Z			22								
		ScP	Z		56	36			3	7				
	CB	eP	E	03	49	32								
		eS	E		52	27								
	KM	eS	X	03	59.3									
	SU	eP	N	03	47	30								
		iS	N		48	51n								
	Epicentre:			03	45	51	24S	179E				550km	USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 8	ON	eP	E	06	54	22							
		eS	E		57	26							
	AK	e	N	06	56	30							
	KP	eP	N	06	54	32							
		e	N		56	47							
	TU	eP	N	06	54	38							
		eS	N		57	49							
	TO	eP	Z	06	54	42							
	WN	iP	NZ	06	55	00							
		e	N		57	38							
		eS	NZ		58	37							
	CB	eP	E	06	55	03							
		eS	E		58	45							
	KM	eP	X	06	55	50							
		eS	X		59	51							
	SU	iP	N	06	51	47n							
		iS	N		52	44							
	Epicentre:			06	50	24	18S		178W		500km		USCGS
9	WN	E	N	13	30	25							
	CH	eL	Z	13	34								
	SU	e	N	13	30								
9	ON	P	E	17	58	49e							
		eS	E	18	00	45							
	KP	P	N	17	59	05							
		eS	N	18	01	09							
	TU	eP	N	17	59	02							
		eS	N	18	01	07							
	TO	P	Z	17	59	14							
		eS	Z	18	01	31							
	WN	eP	N	17	59	36							
		eS	N	18	02	06							
		iS	NZ			08d							
		e	N			32							
		e	N			34							
	CB	eS	E	18	02	21							
	KM	eP	X	18	00	05							
		S	X		03	04							
	SU	iP	N	17	58	48s							
	Epicentre:			17	56	26	27½S		178W		350km		USCGS
10	ON	eP	E	14	56	39							
	TU	eS	N	14	58	08							
	WN	eP	NZ	14	56	41							
		eS	N		59	18							
		eL	N	15	02	.2							
11	ON	eP	E	03	17	34							
	WN	P	NZ	03	18	16							
	CB	eP	E	03	18	20							
	KM	eP	X	03	18	34							
	SU	eP	N	03	15	15							
		e(S)	N		16	20							
	Epicentre:			03	13	47	Fiji				650km		USCGS
13	ON	eP	E	07	44	23							
		eL	E		47	.6							
	AK	eP	N	07	44	.7							
		eL	N		50	.0							
	KP	eP	N	07	45	00							
	TU	eP	N	07	45	03							
		eL	N		48	½							
	WN	P	NZ	07	45	29u							
		e	NZ			41							
		e	N		48	38							
		eL	N		49	¼							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 13	CB	eP	E	07	45	.5							
	SU	eP	N	07	42	18							
		eL	N		43	½							
	Epicentre:			07	40	58	21½S		174E				USCGS
13	ON	eP	E	08	39	.8							
	KP	eP	N	08	40	.2							
	TU	eP	N	08	40	.3							
	WN	eL	N	08	44	¼							
	SU	eP	N	08	37	40							
	Epicentre:			08	36	17	Loyalty Is.						USCGS
13	WN	eL	N	10	12								
	Epicentre:			09	55	30	48½S		124E				USCGS
13	WN	e	N	12	28	½							
13	SU	eS	N	13	19	03							
		L	N		21	30							
16	TU	e	N	08	57	23							
	WN	e(pP)	NZ	08	57	16							
		e	N	09	04	½							
	Epicentre:			08	48	14	4S		139E		150km		USCGS
16	KP	eP	N	16	20	08							
	WN	eP	NZ	16	20	42							
		eL	N		25								
		eLr	Z		26	.7							
	CH	eL	EN	16	25								
	Epicentre:			16	16	19	20S		170½E				USCGS
18	AK	eL	N	09	55								
	TU	eS	N	09	52	16							
	WN	eP	NZ	09	50	40							
		eS	NZ		53	22½							
	SU	eL	N	09	52								
	Epicentre:			09	46	49	27S		176W				USCGS
18	ON	eP	E	18	19	38							
		eL	E		22	.2							
	AK	eL	N	18	22	¼							
	KP	eL	N	18	23								
	TU	eS	N	18	21	45							
	TO	eP	Z	18	20	05							
	WN	eP	NZ	18	20	13							
		eS	NZ		22	54							
		eL	N		23	.8							
	GP	eS	N	18	23	58							
	CH	eLq	EN	18	25	.7							
		eLr	Z		26	.3							
	SU	e(P)	N	18	19	00							
		eS	N		20	30							
		eL	N		21	40							
	Epicentre:			18	16	25	27S		176W				USCGS
18	TU	eP	N	19	12	47							
	WN	eP	NZ	19	13	37							
	GP	eP	N	19	14	29							
19	TO	eP	Z	02	59	18							
	WN	eL	N	03	18								
	GP	eP	N	02	59	26							
	Epicentre:			02	50	31	3S		139½E				USCGS

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 19	WN	eL	N	12	31								
	CH	eL	E	12	36								
	SU	eL	N	12	22								
	Epicentre:			12	02	06	12½N	143½E				USCGS	
20	WN	iP	NZ	12	08	59u							
	GP	eP	N	12	09	03							
	Epicentre:			11	58	37	0	123½E				USCGS	
20	TU	eS	N	18	46	22							
	WN	eS	NZ	18	47	25							
	CB	eS	E	18	47	40							
	GP	eS	N	18	48	28							
21	ON	eP	E	00	05	12							
	KP	eP?	N	00	05	20							
		eS	N		06	37							
	TU	eP	N	00	05	20							
		eS	N		06	16							
	WN	P	NZ	00	05	52							
		S	NZ		07	19							
21	CB	eS	E	00	07	35							
	KM	eS	X	00	08	13							
	GP	eP	N	00	06	34							
		eS	N		08	27							
	Epicentre:			00	04	06	35S	179¾E				NZ	M 5.4 N
21	ON	eP	E	07	14	42							
	TU	e	N	07	15	05							
		eS	N		16	22							
	TO	e(S)	Z	07	17	00							
	WN	eP?	N	07	15	32							
		eS	N		17	31							
	CB	eS	E	07	17	47							
	KM	eS	X	07	18	29							
	Epicentre:			07	13	04	32S	178½W(D)	300km		NZ		M 5¼ N
							Uses additional data from Brisbane, Uppsala and Skalstugan						
21	ON	eP	E	07	57	06							
	KP	eP	N	07	57	20							
	WN	iP	NZ	07	57	39d							
		eL	N	08	09	.0							
	CB	eP	E	07	57	32							
	KM	eP	X	07	57	.7							
	CH	eL	NE	08	10				4	20	9	20	
	SU	eL	N	08	02	½							
	Epicentre:			07	49	47	4S	152½E	100km			USCGS	
22	GP	eP	N	08	16	40							
		i	N			49							
		e	N			59							
		iS	N		17	33							
		e	N			58							
	KM	eP	X	08	16	39							
		i	X			51							
		eS	X		17	29							
		e	X			48							
	CH	e(P)	Z	08	16	44							
		i	E		17	02							
		e(S)	N			30							
	WN	iP	NZ	08	17	16d							
		e	N		18	00							
		eS	N			35							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 22	CB	eP	E	08	16	57							
		e	E		17	04							
		e	E			21							
		iS	E		18	03							
	TO	eP	Z	08	17	38½							
		e	Z			46							
22	NP	e(P)	E	08	17	41							
		e(S)	E		18	53							
	TU	eP	N	08	18	.3							
	KP	eP	N	08	17	51							
		e	N		18	07							
		eS	N		19	34							
	ON	eP	E	08	18	08							
		e	E			15							
		eS	E		20	06							
	DN	eS		08	16	(45)							
		eL			17	(25)							
	SU	eL	N	08	30								
	Epicentre:			08	15	35	45.2S	167.0E			S		NZ (D) M 5.6 NZ
22	ON	eP	E	15	42	33							
		e	E		43	01							
	AK	eL	N	15	47								
	KP	eP	N	15	42	50							
	WN	eP	NZ	15	43	28							
	CH	eL	N	15	51				3	22			
		eL	EZ		52				13	18	11	18	
	SU	(P)	N	15	39	37							
		L			41								
	Epicentre:			15	37	50	Fiji					USCGS	
24	ON	eP	E	20	45	00							
		eL	E		48								
	AK	eL	N	20	49								
	KP	eL	N	20	50								
	TU	eS	N	20	47	22							
	WN	eP	NZ	20	45	54							
		eS	NZ		48	31							
	CB	eL	E	20	52								
	GP	eP	N	20	46	23							
		eS	N		49	34							
	CH	eL	NEZ	20	50				26	16	17	20	17 20
	SU	eP	N	20	44	33							
		eL	N		47	.3							
	Epicentre:			20	42	06	26S	176W				USCGS	
25	WN	eL	N	02	34								
	CH	eL	EZ		31½								
25	WN	eP	NZ	07	27	12							
	KM	eP	X	07	27	37							
	GP	eP	N	07	27	45							
	Epicentre:			07	21	36	Tonga					USCGS	
25	ON	eP	E	14	51	16							
		eL	E		58	.0							
	AK	eL	N	14	59								
	KP	eP	N	14	51	27							
	WN	eL	N	14	59								
	CH	eL	NEZ	14	59								
	SU	eP	N	14	48	00							
		eL	N		49	36							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 25	ON	eP	E	18	12	36							
	KP	eP	N	18	12	54							
	TU	eP	N	18	13	01							
	WN	eP?	N	18	13	10							
		e	N			50							
		eS	N		18	10							
		eLr	NZ		22.2								M 5.9
	GP	eP	N	18	13	40							
	CH	eP	Z	18	13	32							
		eS	E		18	12							
	SU	eP	N	18	10	14							M 5.9
		S	N		12	24							
		L	N			50							
	Epicentre:			18	07	34	14½S	168E				USCGS	
26	TO	e(P)	Z	19	02	52							
		epP	Z		03	08							
	Epicentre:			18	49	56	26S	70½W		100km		USCGS	
26	ON	eP	E	23	31	04							
26	ON	eP	E	23	33	19							
		eS	E		36	17							
		eL	E		37½								
	AK	iP	N	23	33	30n							
		iS	N		36	42n							
		eSS	N		37	22							
		eL	N		38	00							
	KP	eP	N	23	33	46							
		eS	N		37	01							
	TU	eP	N	23	34	02							
		eS	N		37	29							
	TO	eP	Z	23	34	00							
	WN	iP	NZ	23	34	18u							
		i	Z		36	58							
		iS	NZ		38	10n							
		eL	N		39	55							M 7.3
26	CB	eP	E	23	34	18							
		eS	E		38	06							
	KM	eP	X	23	34	27							
		eS	X		38	28							
	GP	eP	N	23	34	39							
		eS	N		38	45							
		eL	N		42								
	CH	P	NEZ	23	34	36	15	8	15	6	8	6	
		iS	NEZ		38	46	44	11	77	14	38	14	
	SU	iP	N	23	32	02n							M 7.1
		i(S)	N		34	11							
	Epicentre:			23	29	41	22S	169E				USCGS	
27	AK	eL	N	01	01								
	WN	eP	NZ	00	56	32			5	10			
		iS	NZ	01	00	20			12	12			M 6.1
		eL	N		02	50							
	GP	eP	N	00	56	51							
	CH	eS	NE	01	00	40			10	12			
		eL	E		01	24	31	15	26	14	13	16	
	SU	eP	N	00	54	12							M 5.9
		eS	N		56	21							
		eL	N			47							
	Epicentre:			00	51	46	21S	168½E				USCGS	

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 27	AK	eL	N	02	28								
	WN	eS	N	02	28	12							
	CH	eS	N	02	28½								
		eL	E		31½								
	SU	e(S)	N	02	23	18							
		eL	N		24.3								
	Epicentre:			02	19	34	Loyalty Is					USCGS	
27	AK	eL	N	06	23								
	WN	eS	N	06	25	57							
	CH	eL	E		28								
	SU	e	N	06	21	17							
		eL	N		22.4								
	Epicentre:			06	17	19	Loyalty Is.					USCGS	
27	WN	eL	N	07	22								
	CH	eL	E	07	21								
	SU	eL	N	07	13								
	Epicentre:			06	59	34	Solomon Is.					USCGS	
27	ON	eL	E	13	27								
	AK	eL	N	13	26								
	KP	eP	N	13	23	12							
	TU	eP	N	13	23	27							
		eS	N		27.0								
	WN	iP	NZ	13	23	46			8	10			
		iS	NZ		27	42			14	10			M 6.3
		eL	N		30	20			70	15			
	GP	eP	N	13	24	21							
		eS	N		28.2								
	CH	eP	NZ	13	24	18	8	8	6	9			
		eS	NEZ		28	08	16	9	26	12	15	21	M 6.4
		L	NEZ				65	14	62	13	54	14	
	SU	eP	N	13	21	30							
		eS	N		23	33							
	Epicentre:			13	19	05	21S	169E				USCGS	
27	WN	eL	N	16	02	35							
	CH	eL	E	16	03								
		eL	NZ		04								
	SU	eL	N	15	58								
	Epicentre:			15	52	20	Loyalty Is.					USCGS	
28	WN	e(L)	N	03	58	15							
	SU	eL	N	03	48½								
28	CH	eL	NE	07	11								
	SU	eL	N	07	04½								
	Epicentre:			06	59	18	Loyalty Is					USCGS	
28	WN	e	N	10	52								
	SU	eL	N	10	36								
28	ON	eP	E	15	14	04							
		e	E			41							
	KP	eP	N	15	14	37							
	TU	eP	N	15	14	13							
		S	N		15	57							
	WN	eP	N	15	14	47							
		iS	N		17	06							
	CB	e(P)	E	15	15	08							
		S	E		17	25							
	KM	eS	X	15	18	08							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
NOV 28	GP	eP	N	15	15	23							
		S	N		18	11							
	CH	eL	NE	15	19½								
		eL	Z		22								
	28 SU	eP	N	15	14	38							
		eS	N		16	43							
		eL	N		17.7								
	Epicentre:			15	11	33	30S	176W				USCGS	
	28 WN	eSKS	N	19	50	44			3	7			
		eS	N		51	20			3	5			
		eSS	N		57.2								M 7.0
		eSSS	N	20	01.2								
		eL	N		09.6								
	CH	eSKS	N	19	50	58							
		ePS	NZ		52	54	3	12	4	12			
		eLq	E	20	05								
		eLr	NZ		12		4	20	8	26			
	SU	e	N	19	39	18							
		eS	N		47	37							
		ePS	N		48	09							
		eL	N		59								
	Epicentre:			19	27	11	49½N	155E				USCGS	
	29 WN	e	N	04	51	11							
		eL	N		52¾								
	CH	eL	NZ	04	51								
	29 WN	iP	NZ	09	27	02d							
		eS	N		36	34			3	7			
		e	N		37	16							
		eL	N		54				11	20			
	CH	P	Z	09	27	07d	6	5					M 6.9
		eS	NE		36	46							
		eL	E		49						4	24	
		eL	NZ		54								
	SU	e	N	09	25	36							
		ePP	N		27	39							
	Epicentre:			09	15	20	27N	141E				USCGS	
	30 AK	e	N	11	38								
	WN	e	N	11	43								
	SU	e	N	11	31	05							
		eL	N		33½								
	30 WN	eL	N	17	03¾								
	KM	eP	X	16	57	00							
	GP	eP	N	16	57	09							
		eS	N	17	01	29							
	CH	eL	NE	17	04								
	SU	e(P)	N	16	53	29							
		eL	N		55.2								
	Epicentre:			16	51	28	20½S	174½W				USCGS	
DEC 1	SU	eP	N	07	46	24							
		eiS	N		48	25							
	ON	eL	E	07	52±								
	AK	eL	N	07	53±								
	KP	eS	N	07	47	53½							
	WN	eP	NZ	07	48	29							
		eS	N		52	22							
		eL	NZ		54½								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 1	CH	eL	E	07	54½								
		eL	Z		56								
	Epicentre:			07	43	51	22S	169E				USCGS	
	2 SU	eP	N	16	35	48							
		eS	N		37	10							
		eL	N		37.4								
	ON	eP	E	16	38	32							
	AK	S	N	16	42	47							
		eL	N		46½								
	KP	eP?	N	16	38	39							
		eP	N		46								
	WN	eL	Z	16	49.2								
	CH	eL	NE	16	47.5								
	Epicentre:			16	33	36	Tonga					USCGS	
	3 WN	eL	N	08	10±								
	CH	eL	EZ	08	13±								
	Epicentre:			07	20	08	53½N	169W				USCGS	M 6½(Pas)
	4 ON	P	E	10	17	52							
	KP	eP	N	10	17	38							
	WN	iP	Z	10	17	28							
		eLq	N	10	30.3								
		eLr	Z		34.9								
	KM	eP	X	10	17	45½							
	GP	P	N	10	17	28½							
	CH	S?	N	10	25	21							
		eLq	N		31.8								
		eL	Z		33.8								
		eLr	EZ		35.4								
	Epicentre:			10	07	54	45½S	106W				USCGS	
	4 ON	P	E	13	26	19½							
	KP	eP	N	13	26	35							
	GP	eP?	N	13	27	30							
		e(P)	N		45½								
	Epicentre:			13	21	07	Samoa Felt Apia					USCGS	
	6 SU	eP	N	01	48	37							
		S	N		51	39							
	8 SU	e(S)	N	16	30	39							
	AK	(SKS)	N	16	33	58							
		eSS	N		40	03							
		eLr	N		51	15							
	KP	eP	N	16	23	20							
	WN	i(SKS	N	16	34	00							
		eLr	NZ		56.0								
	CH	SKS	NE	16	34	22							
		eS	Z		36	08							
		eS	NE		15								
		eSS	NE		41.0								
		eLq	N		50.0								
		eLq	E		50.8								
		eLr	N		53.9								
		eLr	Z		54.7								
		eLr	E		55.4								
	Epicentre:			16	10	27	51N	179½W				USCGS	M 6½(Berk)

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 9	ON	P	E	01	16	56							
		e	E		17	48							
		eS?	E		20	00½							
	KP	eP?	N	01	17	09½							
	GP	eP?	N	01	18	02½							
10	SU	e(L)	N	04	45	18							
13	KP	e(P)	N	15	02	12							
	WN	(P)	NZ	15	02	18							
	KM	e(P)	X	15	02	14½							
	GP	e(P)	N	15	02	20							
	Epicentre:			14	52	02	2N		126½E			USCGS	
14	SU	e(P)	N	19	28	12							
		(S)			29	33							
	ON	P	E	19	29	21½							
	WN	P	NZ	19	33	20½							
	CB	eP	X	19	33	35							
	KM	eP	X	19	34	13							
	GP	eP	N	19	34	21							
15	SU	P	N	17	27	29							
		i	N			35							
		S	N		29	25							
		e	N			42							
	ON	iP	E	17	29	38							
		(pP)	E		30	17½							
	KP	eP	N	17	29	48½							
		e	N		30	16							
		e	N			46½							
	WN	iP	NZ	17	30	15							
		eL	N	Traces									
	CB	P	E	17	30	12½							
	KM	P	X	17	30	22½							
		eS	X		35	08							
	GP	iP	N	17	30	32½							
		eS?	N		35	24							
	CH	iP	Z	17	30	32½							
		e(L)	Z		40	20							
		eL	Z		43	02							
16	CH	eL	NEZ	02	32.4								
	Epicentre:			01	41	52	6½N		78W			USCGS	M 6½(Pas)
16	ON	eS-i(P)			01	09							
	KP	iP	N	10	40	51s							
		eS	N		41	36							
	NP	e	E	10	40	57½							
		eS	E		41	38							
	WN	iP	NZ	10	40	32d							
		S	N		41	03							
	CB	e	E	10	40	58							
		eS	E		41	44							
	KM	e	X	10	41	19							
		S	X		42	10							
	GP	e	N	10	41	14							
		S	N			54							
	Epicentre:			10	39	50	41.25S		178.2E		S	NZ (C)	M 5.2 N
16	SU	e(L)	N	12	18	18							
		e?	N		19	14							
	ON	P	E	12	17	42½							
	AK	S	N	12	24	08n							
		L	N		25	14							
	KP	eP	N	12	18	01½							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.
DEC 16	WN	eL	N		23-								
	CH	eL	Z		25.3								
		i?	Z		32	14							
16	ON	eiP	E	22	08	39							
		i?			11	49							
	KP	e(P)	N	22	09	02							
		e(S)	N		10	25½							
	WN	(P)	NZ	22	09	33½							
		S	NZ		11	28½							
	KM	eP?	X	22	10	00							
		S	X		12	32							
	GP	eP?	N	22	10	31							
		S	N		12	34							
	Epicentre:			22	06	43	Kermadec Is					USCGS	
							30.3S 178.6W			N		NZ (D)	M 5¾ NZ
18	KP	eP	N	02	44	16½							
		e(pP)				29½							
	WN	iP	NZ	02	44	22d							
		e(S)	N		54	34							
		eSS	N	03	00	45							
		eLq	N		07.7								
		eLr	NZ		12.6								
	CB	eP	E	02	44	17½							
		(pP)	E			29½							
	KM	eP	X	02	44	20							
		(pP)	X			39½							
	GP	eP?	N	02	43	54½							
		(pP)	N		44	18							
	CH	P	Z	02	44	08½u?							
		ipP	Z			23d							
		e?	Z		54	17							
		eS	EZ		53								
		eL	NEZ	03	12±								
	Epicentre:			02	31	00	25½S		68½W			USCGS	M 7 (Pas) M 6¾(Berk)
18	ON	e	E	05	44	26							
	KP	eP	N	05	42	56							
		S	N		43	31							
	NP	eP	E	05	42	38½							
		iS	E		43	03							
	WN	iP!	NZ	05	42	35½s							
		iS	NZ		43	00							
	CB	iP	E	05	42	30w							
		S	E			51							
	KM	iP	X	05	42	46sw							
		iS	X		43	17½							
	GP	P	N	05	42	53							
		iS	N		43	31½							
	Epicentre:			05	42	03	40.7S 173.9E 180km					NZ(C)	M 5½ NZ
							Felt Wellington MM I-II						
18	WN	e	N	19	40.9								
		e(L)	N		50.8								
		eLr	N		55.2								
	CH	e(L)	N	19	50.0								
		eL	NZ		53±								
19	ON	eP	E	21	50	06							
		eS	E			46							
	KP	eP	N	21	50	04½							
		eS	N			43							
	WN	eP	NZ	21	50	37							
		e	N			56							
		eS	N		51	40							

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
DEC 19	CB	eS	E	21	51	52								
	KM	eS	X	21	52	29								
	GP	P	N	21	51	11								
		S	N		52	39								
	Epicentre:			21	49	13	36.35S		176.85E		330km		NZ (B)	M 5½ NZ
20	SU	eP	N	11	02	27								
		i	N			48								
		i(S)	N		04	10								
		e	N		05	18								
		L	N			50								
	ON	eP	E	11	02	52½								
		e	E		03	09								
		e(S)	E		05	37								
		e(L)	E			48								
	AK	eP	N	11	03	(22)								
		e	N			(41)								
		e	N			(55)								
		e(S)	N		05	(36)								
		L	N		06	(17)								
	KP	eP	N	11	03	15½								
		eS	N		05	28½								
	NP	eS	E	11	06	34								
	WN	iP	NZ	11	03	46								
		e(S)	N		06	26								
		S	N			29								
	CB	eP?	E	11	04	05½								
		eP	E			14½								
		eS	E		06	43								
	KM	eP?	X	11	03	35								
		eP			04	17½								
		eS			07	32								
	GP	eP	N	11	04	18½								
		e(S)			07	32								
		S				38								
	CH	e?	Z	11	06±									
		e	Z		08	08								
		L	NEZ		09±									
	TO	eP	Z	11	03	16½								
		eS			05	48½								
	Epicentre:			10	59	56	27S		176W				USCGS	M 6½(Pas)
21	SU	P	N	00	21	00								
		e				24								
		e				47								
		S			23	26								
		e			25	43								
21	AK	e	N	07	15	30								
	WN	e(P)	N	07	14	36								
		eL	N	Traces										
21	ON	eP	E	07	25	16								
	AK	eS	N	07	29	18								
	WN	e(P)	N	07	28	30								
		eL	N	Traces										
21	ON	eP	E	08	32	14								
	NP	e?	E	08	37	58								
	WN	eS	NZ	08	35	04								
	CB	eS	E	08	35	29								
	GP	eS	N	08	36	10								
21	SU	eL	N	09	36.8									
	AK	eL	N	09	44ca									
		e	N	10	03ca									
	WN	eL	NZ	09	46.8									
	CH	eL	NEZ	09	48ca									
	Epicentre:			08	58	53	51N		131W				USCGS	M 6¾(Pas) M 6¾(Berg)

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te		Mag.
DEC 22	SU	P	N	22	41	14								
		e?	N		42	11								
		e?			44	25								
	ON	eP	E	22	40	25½								
	KP	eP?	N	22	40	36½								
		P			44									
		S			42	20½								
	TO	eP	Z	22	40	47½								
		eS			42	45								
	WN	eP	NZ	22	41	13								
		iS	N		43	23								
	CB	e(P)	E	22	42	32½								
		S	E		43	40½								
	KM	eP?	X	22	41	52								
		P	X			54½								
		S	X		44	21								
	GP	P	N	22	41	48								
		S	N		44	27								
	CH	e	E	22	42	23½								
		eS	E		44	28								
	Epicentre:			22	38	12	29½S		177W				USCGS	
23	ON	eP	E	08	48	00								
	KP	eP	N			12								
		e?	N		49	09								
	TO	P	Z		48	18								
	WN	iP	Z			28½u								
	CB	eP	E			26								
	GP	P	N			36								
	Epicentre:			08	37	26	22N		144½E		100km		USCGS	M 6½ Pas
25	SU	P	N	04	31	20								
		eS	N		32	20								
	ON	eP	E		33	50								
		e	E		34	15								
		S	E		37	00½								
	KP	P	N		34	02¾								
		e(S)	N		37	25								
		iS	N			32¾								
	NP	eS	E	Timing Unreliable										
	WN	iP	ZN		34	36½								
		eS	N		38	21½								
		i	N			27u								
		i	N			30½								
		e	N			32½								
		e	N		45	30								
	CB	eS	E		38	35								
	KM	eP	X		34	56½								
		eS	X		39	06¾								
	GP	eP	N		35	03								
		eS	N		39	20½								
	CH	L	NE	Traces										
	Epicentre:			04	29	53	Tonga				200km±		USCGS	
25	SU	e(PKP)	N	09	55	19								
		i(PP)	N		56	27								
	CH	L		10	55±		Traces							
	Epicentre:			09	33	37	48½N		28W				USCGS	M 6½ Pas
25	SU	e(P)	N	13	39	44								
		eL	N		43.5									
	ON	eP	E		38	46								
		e	E			53½								
		i	E			59								

Date	Stn	Phase		h	m	s	Az	Tz	An	Tn	Ae	Te	Mag.	
DEC 25	KP	eP?	N		39	15½								
		eP	N			30								
		e(S)	N		40	43½								
		e	N		41	15								
	TO	eP	Z	13	39	12½								
		eS	Z		41	03½								
		e	Z			57½								
	NP			Not recorded										
	WN	eS	ZN		41	46								
		eL	N		43±									
	CB	eS	E		42	06								
	KM	e(P)	X		40	13								
		eS	X		42	48								
	GP	eP	N		40	15								
		S	N		42	50								
	CH	eL	NE		44.3									
26	ON	e	E	07	52	57								
	TO	eP	Z		52	32½								
	KP	eP?	N			38								
	WN	eL	N	08	02									
27	SU	iP!		00	15	50s								Large amplitudes confuse other phases.
	ON	eP?			17	29½								
		(P)				31½								
		eS			20	28								
	AK	eP			17	38								
		e			18	52								
		S			20.5									
	KP	eP			17	46								
		i			18	03								
		S			20	41								
		eScS			29	45½								
	TO	P			17	57u?								
		eS			21	00								
	NP	eP?			17	59								
		e(P)			18	04								
		eS			21	14½								
	WN	eP	ZN		18	19								
		e	N		19	58								
		eS	N		21	40								
		eScS	N		29	36								
	CB	eP			18	24								
		eS			21	54								
	KM	eP			18	45								
		eS			22	28								
		eScS?			29	40								
	CH	eP			18	(50)								
		eS			22	(47)								
	GP	eP			18	49½								
		eS			22	37½								
		eScS			29	47½								
		e			30	10								
28	ON	eP	E	14	25	26								
	KP	eP	N		24	59½								
		S	N		25	27								
	TO	iP	Z			03								
	WN	eP	N			27								
		S	N		26	15								
	CB	eP	E		25	41								
		S	E		26	40								
	GP	eP	N			04								
		S	N		27	17								

Epicentre: 14 24 24 — 38.3S 178.5E S NZ (C) M 6.4
Felt: Gisborne, Opotiki District.
Minor damage and landslides in the epicentral region.

PRINCIPAL N.Z. EARTHQUAKES IN 1956

1956 March was the most active month since the Cheviot earthquakes of 1951 January, 72 shocks being reported felt. Two damaging shocks occurred during the year, and the unusually large number of shocks perceptible in the Auckland district attracted some public comment. In all, 131 earthquakes were reported felt, 110 in the North Island, and 27 in the South Island.

The most severe earthquake (Epicentre 56/189) took place on 1956 December 28. Its magnitude was 6.4, and in the sparsely populated area between Opotiki and Tolaga Bay felt intensities of at least MM7 were reached, with some minor damage and landslides. The area of perceptibility extended from the western Bay of Plenty to the northern Manawatu, and there were many aftershocks, several of magnitude 5 or more.

Slight damage to chimneys and stacked goods in shops occurred at Tokaanu on 1956 March 2 as the result of a shock of magnitude 5.3 centred some 10 miles to the northwest of that settlement. Felt intensities reached MM6-7. Owing to the small focal depth, the shock was not felt at distances greater than about 60 miles from the epicentre (56/45). Numerous aftershocks followed. Officers of the N.Z. Geological Survey who visited the area reported that gas was "boiling" from the bed of Lake Taupo near the village of Waihi. They attributed this to the liberation of methane which had been trapped in the sediment on the lake bed. A wave 3-ft high was reported at the delta of the Tongariro River. No new displacements of any of the many known faults in the area were detected. An isoseismal map is reproduced in this bulletin.

On 1956 January 30, a magnitude 6 earthquake (Epicentre 56/21) centred in the Bay of Plenty some 70 miles to the north-east of Tauranga was felt from Auckland city to the East Cape region. A series of shocks of about magnitude 5 originating near Great Barrier Island on 1956 March 14 was also felt in Auckland and on the Coromandel Peninsula. A further shock of magnitude 5.5, belonging to this series occurred on 1956 April 7. An isoseismal map for the main shock appears elsewhere in this bulletin.

The only other local shocks reported to have reached MM5 were felt at Wanganui on 1956 May 1 and 1956 June 15.

Instrumentally Determined Epicentres

The following list gives the epicentres of all earthquakes reported felt, and of all instrumentally recorded earthquakes of magnitude 4 and above. An explanation of the notation will be found at the beginning of the Section 'Station Readings'. These epicentres have been plotted on the folding maps at the back of this Bulletin.

No	Date	Time (UT)	Epicentre	Depth	Mag.	Class
56/1	JAN 6	09 57 57	41.75S 174.2E	100km	4.0	C
2	6	17 55 42	41.35S 173.5E	150km	4.0	C
3	7	12 00 40	41.2S 176.9E	N	4.1	D
4	8	08 18 18	38.75S 175.65E	140km	5.0	D
5	8	16 39.2	37¼S 175½E		4½	B
6	11	05 40 27	39.2S 174.85E	180km	6¼	D
7	11	14 59 36	35¾ 179½E	N	5.4	B
8	13	06 33 05	38.9S 175.7E	110km	3.8	D
9	13	07 02 02	38.8S 175.'E	120km	4.1	C
10	13	07 11 18	38.9S 175.6E	N	4.2	C
11	13	07 18 34	39.1S 175.7E	N	4.1	C
12	13	07 23 05	38.9S 175.7E	110km	4.3	C
13	13	07 34.5near	33S 178E		5½	D
14	13	16 37 45	39.4S 177.3E	N	3.7	C
15	20	09 03 39	40.25S 178.1E	N	5.0	B
16	20	16 36 53	37.35S 176.7E	210km	4½-4¾	C
17	20	18 00 51	38.6S 175.8E	185km	5¾	C
18	22	13 35 20	37.3S 175.7E	N	4½	D
19	26	23 29 56	33½S 179W		5.7	D
20	28	15 10 47	39.55S 174.65E	125km	4.4	C
21	30	08 43 00	36.9S 177.1E	S	6.0	B
22	30	09 47 25	36.95S 177.1E	S	5.3	C
23	30	09 52 16	36.9S 177.1E	S	4.8	C
24	30	10 01 51	36.9S 177.1E	S	5.6	C
25	31	07 09 04	39.25S 177.5E	70km	5.1	D
26	FEB 8	10 32 59	38.35S 176E	210km	5.9	C
27	8	23 13 59	38.9S 178.1E	N	4.3	C
28	10	00 49 40	37.4S 177.2E	N	4	D
29	14	14 54 17	42.9S 173.0E	N	4.6	C
30	16	16 52 18	35.1S 179.8W	S	5.0	D
31	17	09 43 33½	42.25S 174.0E	S	5.0	C
32	18	13 29 51½	38.2S 175.8E	275km	4.6	C
33	21	01 41 58	42.7S 171.3E	S	4.7	C
34	21	20 55 25	37.35S 177.0E	N	3.7	D
35	21	23 24 29½	42.8S 171E	N	4.0	C
36	22	21 57 35½	40.9S 174.8E	N	3.7	D
37	24	09 18 57	35.0S 179.6W	S	5.9	C
38	27	03 27 29½	39.2S 174.8E	200km	5.3	B
39	28	16 31 42	34.9S 179.1W	N	5.0	C
40	29	17 15 19	38.8S 176.3E	75km	4.5	C
41	MAR 1	14 46 00	37.2S 177.3E	150km	4.1	D
42	2	02 33 21	38.85S 175.7E	S	4.4	B
43	2	07 59 47	38.85S 175.7E	S	4.2	D
44	2	11 45 44	40¾S 174¾E	N	3.9	B
45	2	22 43 51	38.85S 175.7E	S	5.3	B
46	3	01 20 53	38.85S 175.7E	S	4.2	B
47	3	02 20 16	38.85S 175.7E	S	4.0	B
48	3	02 32 47	38.85S 175.7E	S	4.2	B
49	3	03 18 03	38.85S 175.7E	S	4.3	B
50	5	01 21 44	38.85S 175.7E	S	3.8	C
51	8	08 52 00	35.9S 177.7E	S	4¼	D
52	10	20 15 42	45S 168E	N?	5.0	D

No	Date	Time (UT)	Epicentre	Depth	Mag.	Class
56/53	MAR 13	17 26 26	44¼S 168E	N?	4.7	D
54	14	11 29 21	36.7S 177.7E	S	4¼	D
55	14	14 19 12	36.7S 177.7E	S	5	S
56	14	14 39 32	36.7S 177.7E	S	4½	D
57	14	15 38 44	36.7S 177.7E	S	5¼	B
58	14	15 43 25	36.7S 177.7E	S	5.5	C
59	14	15 48 33	36.7S 177.7E	S	4½	D
60	14	16 13 59	36.7S 177.7E	S	5-5¼	D
61	14	16 17 12	36.7S 177.7E	S	4¼	D
62	14	19 29 55	40.3S 175.7E	N	4.3	D
63	15	08 47 07	37.6S 177.9E	100km	5.0	C
64	15	17 58 42	36.7S 177.7E	S	5.2	C
65	16	08 40 53	36.7S 177.7E	S	5¼-5½	C
66	16	09 58 46	42.0S 175.4E	S	4.6	C
67	16	13 44 11	36.7S 177.7E	S	4¾	D
68	16	14 07 05	36.7S 177.7E	S	4½	C
69	17	02 09 03	36.7S 177.7E	S	5	C
70	17	19 24 49	36.7S 177.7E	S	4½	D
71	19	03 44 36	39.9S 174.0E	130km	4.5	B
72	21	15 32 44	38.9S 175.7E	S	3.8	C
73	21	18 31 59	38.9S 175.7E	S	3.4	D
74	24	16 12 30	38.0S 176.7E	N	3½	D
75	25	23 18 04	38¼S 176E	180km	4½	D
76	27	02 38 51	41.0S 174.3E	60km	5.5	B
77	30	07 55 38	34¼S 179½W	N?	5.7	D
78	31	03 26 18	40.9S 174.6E	70km	4.0	B
79	APR 4	17 10 25	38.0S 175.9E	100km	4.0	D
80	5	20 24 40	39.9S 178.1E	S	4.2	C
81	7	18 04 40	36.0S 177.0E	S	5.5	D
82	7	18 42 14	36.0S 177.0E	S	4.1	D
83	7	18 50 16	36.0S 177.0E	S	4.1	D
84	7	19 11 44	36.0S 177.0E	S	4.1	D
85	7	19 44 38	36.0S 177.0E	S	4.0	D
86	7	21 31 00	36.0S 177.0E	S	4.0	D
87	7	21 48 58	36.0S 177.0E	S	4.0	D
88	7	22 21 17	36.0S 177.0E	S	4.6	D
89	8	13 52 09	36.0S 177.0E	S	4.2	D
90	8	18 28 38	39.9S 174.4E	90km	5.0	C
91	8	20 37 50	36.0S 177.0E	S	4.0	D
92	11	09 28 40	39.0S 178.0E	N	4.1	C
93	13	21 06 29	40.3S 174.3E	50km	4.0	C
94	14	03 12 28	38.3S 176.1E	150km	4.1	D
95	16	02 19 36	37.2S 177.3E	300km	4.7	D
96	18	19 10 39	37.8S 178.3E	90km	4.7	C
97	19	09 30 40½	37.7S 178.2E	100km?	5.0	C
98	20	18 43 53	41.9S 173.0E	S	4.0	C
99	25	13 22 54	38.0S 176.4E	160km	4.2	C
100	28	14 54 30	32.7S 178.3W	S	6.0	C
101	29	01 11 46	41.5S 174.6E	N	3.4	D
102	MAY 1	18 19 35	40.1S 175.4E	N	4.2	C
103	5	11 24 53	39.0S 177.2E	60km	4½	C
104	7	10 11 51	41.1S 174.4E	70km	4½	B
105	8	23 37.5	45S 171E	N?	3½	C
106	19	16 53 46	38.1S 176.1E	200km	4¾	D
107	20	02 33 31	41.4S 174.0E	70km	3.7	B
108	21	06 29.3	45S 168E	N?	4	C
109	23	14 59 56	42.0S 173.9E	S	4.8	D
110	25	12 13 20	33S 177W	N	5.7	B
111	28	20 55 18	40.2S 173.95E	120km	4.3	D
112	29	22 58 22	40.8S 175.3E	N	4.3	C
113	31	09 39 44	37.8S 177.5E	S	4.5	C
114	JUN 12	19 55 52	40.3S 174.0E	60km	4.0	D
115	13	05 42 31	44.8S 168.1E	N	4.8	B
116	14	12 13 43	40.1S 175.0E	N	4.1	D
117	16	19 38 06	41.3S 173.1E	60km	4.3	C
118	17	01 08ca	43S 173E	N	2½	C
119	17	03 01 33	31.7S 179.0W	200km	6.4	D

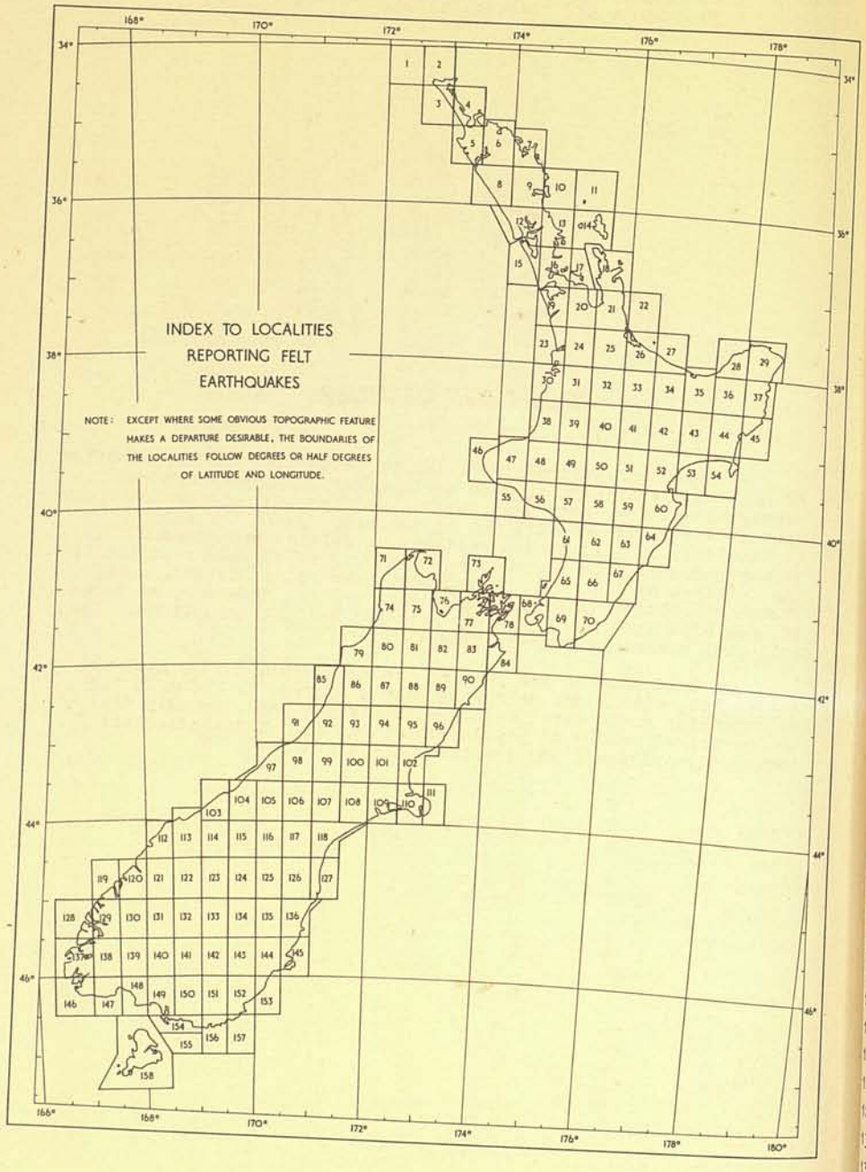
No	Date	Time (UT)	Epicentre	Depth	Mag.	Class
56/120	JUN 18	04 13 43½	33½S 179¾W	N	5.4	D
121	19	10 02 39	38.0S 176.2E	175km	4.6	D
122	19	18 26 00	39.2S 174.6E	N	4.4	C
123	21	06 48 15	37.2S 177.4E	120km	4.6	C
124	24	11 21 56	36.5S 178.1E	180km	4.8	C
125	24	22 47 16	41.4S 174.5E	S	3.6	D
126	26	13 47 31	34.0S 179.7E	120km	5.1	C
127	JUL 2	13 22 09	38.7S 175.8E	160km	4.4	D
128	2	17 24.0	33½S 179W	N	6	C
129	8	02 53 25	39.1S 175.3E	S	3.5	D
130	8	11 03 02	37.4S 177.2E	210km	4½	C
131	8	15 49 06	37.9S 176.55W	150	4.4	C
132	9	03 28.0	46½S 167½E	N	5.1	C
133	15	03 59 18	41.4S 174.5E	N	3.5	D
134	16	14 16 52	39.4S 178.1E	N	4.5	C
135	17	13 29 07	38.3S 178.5E	S	4.4	C
136	20	14 23.0	44S 169½E	N	3½	C
137	21	11 34 05	38.5S 179.6E	N	4.5	D
138	31	21 18 43	39.0S 179.0E	S	4.7	C
139	31	20 36 21	37.6S 176.5E	200km	5¼	D
140	AUG 2	17 05 30½	38.3S 176.0E	190km	4.1	C
141	5	15 38 50½	38.05S 176.1E	250km	4¼	C
142	8	09 06 13	40.2S 174.9E	S?	3.8	C
143	18	11 17 10	42.5S 171.3E	S	2	D
144	19	04 57 31	40.1S 175.1E	S?	4.1	C
145	20	02 39 12	41.2S 175.9E	S	3.9	D
146	24	02 47 38	39.7S 175.0E	60km	3.8	D
147	25	07 31 41	37.4S 177.0E	225km	5	B
148	26	11 10 55½	41.3S 174.8E	S	2½	D
149	SEP 4	02 49 42	38.9S 177.5E	170km	4.2	C
150	5	21 45 38	40.3S 173.4E	170km	4.5	B
151	14	20 19 54	39.15S 174.9E	200km	4.8	C
152	18	06 05 18	41.3S 174.3E	70km	4.4	B
153	20	08 02 26	42.4S 174.0E	N	4.1	C
154	20	09 19 48	38.85S 177.65E	60km	4.8	C
155	22	02 55 21	38.3S 176.0E	175km	4.7	C
156	22	05 08 36	40.8S 172.7E	N	4.1	B
157	22	16 19 22	35.3S 176.9E	S	4.7	B
158	24	04 30 41	42.4S 173.1E	N	4.7	D
159	24	15 15 47½	41.4S 174.0E	N	4.4	C
160	25	02 00 54	34S 178¾W	N?	5¼	B
161	OCT 1	04 34 52	39.2S 175.2E	N	4.4	D
162	3	14 52 32	47.3S 164.7E	N	5¼	C
163	5	22 36ca	43S 171E	N	-	D
164	10	09 48 37	41.1S 173.9E	N?	4	D
165	14	22 05 24½	40.8S 174.5E	N	4.2	C
166	15	03 48 45	38.4S 178.7E	N	5¼	C
167	15	23 16 13	35.9S 179.0E	N	4.9	D
168	22	00 13 19	39.3S 177.1E	N	3.9	D
169	23	22 12 48	40.2S 173.7E	120km	3¾	C
170	NOV 6	03 34 16	38.6S 176.0E	S	3¾	C
171	8	22 22 09	41.05S 174.0E	60km	4.1	C
172	10	00 10 10	38.8S 175.6E	90km	4.2	C
173	11	22 04 18	40.7S 176.2E	N	4.0	D
174	14	07 52 38	41.4S 172.1E	N	4.5	C
175	16	14 18 42	38.95S 175.4E	80km	4.1	B
176	17	02 33 26	38.6S 176.0E	160km	4.1	C
177	20	21 28.3	45¼S 167E	S?	4.8	D
178	21	00 04 06	35S 179¾E	-	5.4	D
179	21	07 13 04	32S 178½W	300km	5¾	D
180	22	08 15 35	45.2S 167.0E	S	5.6	D
181	28	16 26 23	38.4S 178.1E	N	4.3	C
182	DEC 1	05 05 05	38.3S 178.3E	S	4.8	D
183	1	13 52 39	38.35 178.2E	S	4.3	D
184	9	11 41 30	41⅛S 173E	S	4.4	D
185	16	10 39 50	41.25S 178.2E	S	5.2	C
186	18	05 42 03	40.7S 178.9E	180km	5½	C

No	Date	Time (UT)	Epicentre	Depth	Mag.	Class.
56/187	DEC 19	21 49 13	36.35S 176.85E	330km	5¼	B
188	27	05 56 53	39.8S 174.5E	90km	4.3	C
189	28	14 24 25	38.35 178.5E	S	6.4	C
190	29	09 13 15	41.4S 172.6E	180km	4.7	B
191	30	05 14 53	38.3S 177.5E	S	4.9	C

INDEX OF FELT EARTHQUAKES

A number of difficulties aries in estimating the distribution of felt intensities in a given earthquake. Observers are not evenly distributed over the country, and personal circumstance may prevent them from noticing the earthquake. There are also difficulties in listing the earthquakes felt at any given place. It may reasonably be assumed that a strong earthquake reported from one township will be felt in another a few miles distant, even though the observatory has received no report. However, an index of this kind must summarise the data and not the deductions. The following scheme is therefore used.

The land area of New Zealand has been divided into numbered rectangles, with sides measuring half a degree, as shown in the accompanying map. Each rectangle is given a name, usually that of the principal centre of population within it. These areas are termed 'localities', and the names are as follows:



1. Three Kings
2. Te Reinga
3. Ninety Mile Beach
4. Doubtless Bay
5. Kaitaia
6. Kaikohe
7. Bay of Islands
8. Dargaville
9. Whangarei
10. Bream Head
11. Moko Hinau
12. Kaipara
13. Warkworth
14. Barrier Islands
15. Helensville
16. Auckland
17. Waiheke
18. Coromandel
19. Pukekohe
20. Mercer
21. Thames
22. Mayor Is.
23. Raglan
24. Hamilton
25. Matamata
26. Tauranga
27. Whakatane
28. Te Kaha
29. East Cape
30. Kawhia
31. Te Kuiti
32. Tokoroa
33. Rotorua
34. Murupara
35. Opotiki
36. Motu
37. Tolaga Bay
38. Mokau
39. Taumarunui
40. Tokaanu
41. Taupo
42. Te Whaiti
43. Tuai
44. Whakapunaki
45. Gisborne
46. Cape Egmont
47. New Plymouth
48. Whangamomona
49. Ohakune
50. Chateau
51. Kaweka
52 Napier
53. Wairoa
54. Mahia
55. Hawera
56. Waverley
57. Wanganui
58. Taihape
59. Ruahine
60. Hastings
61. Bulls
62. Palmerston North
63. Dannevirke
64. Porangahau
65. Otaki
66. Masterton
67. Castlepoint
68. Wellington
69. Featherston
70. Martinborough
71. Mt Stevens
72. Takaka
73. D'Urville Is.
74. Karamea
75. Motueka
76. Nelson
77. Blenheim
78. Picton
79. Westport
80. Murchison
81. Glenhope
82. Wairau
83. Awatere
84. Cape Campbell
85. Greymouth
86. Reefton
87. Maruia
88. Hanmer
89. Clarence
90. Kaikoura
91. Hokitika
92. Kumara
93. Arthurs Pass
94. Lake Summer
95. Culverden
96. Cheviot
97. Franz Josef
98. Hari Hari
99. Whitcombe Pass
100. Lake Coleridge
101. Oxford
102. Rangiora
103. Haast
104. Bruce Bay
105. Mt Cook
106. Tekapo
107. Mt Somers
108. Ashburton
109. Rakaia
110. Christchurch
111. Akaroa
112. Big Bay
113. Jacksons Bay
114. Makarora
115. Lake Ohau
116. Pukaki
117. Fairlie
118. Timaru
119. George Sound
120. Milford
121. Glenorchy
122. Arrowtown
123. Wanaka
124. St Bathans
125. Kurow
126. Duntroon
127. Waimate
128. Secretary Is.
129. Doubtful Sound
130. Te Anau
131. Livingstone Mts
132. Kingston
133. Alexandra
134. Poolburn
135. Ranfurly
136. Oamaru
137. Resolution Is.
138. Pillans Pass

139.	Monowai	140.	Mossburn	141.	Waikaia
142.	Roxburgh	143.	Lawrence	144.	Outram
145.	Dunedin	146.	Puysegur Pt.	147.	Poteretere
148.	Tuatapere	149.	Invercargill	150.	Gore
151.	Clinton	152.	Balclutha	153.	Waihola
154.	Bluff	155.	Ruapuke	156.	Tahakopa
157.	Owaka	158.	Stewart Is.		

The first section of the list gives the places from which each earthquake has been reported, classified according to intensity on the Modified Mercalli scale. When the place reporting is not a 'locality', the number of the locality follows it in brackets. In the second section, the localities reporting shocks during the year are listed in numerical order, followed by the number of the shock in the epicentre list and the intensity. By comparing the reports from a given locality with those of the neighbouring ones, it is possible to form a truer estimate of the incidence of felt earthquakes than would be possible from a simple list of places reporting each shock.

PLACES REPORTING FELT EARTHQUAKES

56/3 Jan 7d 00h 40m
MM2 Dannevirke

56/4 Jan 8d 08h 18m
MM2 Dannevirke

56/6 Jan 11d 05h 40m
MM3 Ohakune, Hunterville (58), Dannevirke, Bunnythorpe (62), Foxton (61), Nelson.
MM2 Paraparaumu (65), Christchurch.

56/8 Jan 13d 06h 33m
? Chateau

56/10 Jan 13d 07h 18m
? Chateau

56/14 Jan 13d 16h 37m
MM2 Napier
? Auckland

56/21 Jan 30d 08h 43m (See Isoseismal Map)
A special questionnaire was issued concerning the effects of this earthquake. Owing to the large number of answers received, only the maximum intensity for each locality is listed. The actual observations are shown on the isoseismal map appended to the bulletin. One figure in many cases represents a number of independent and accordant observations from the same settlement. It is rare for two such observations to differ by more than one degree of the MM intensity scale, and the local irregularities revealed by the map are considered to represent real variations in intensity.

MM5 Opotiki, Tauranga, Thames, Motu, Matamata.
MM4 Barrier Is., Coromandel, Rotorua, Murupara.
MM3 Warkworth, Auckland, Waiheke, Mercer, Whakatane, Te Kuiti.
MM2 Raglan, Hamilton, Tokoroa
MM1 Helensville, Kawhia, Te Whaiti
? Tolaga Bay.

56/22 Jan 30d 09h 47M
MM3 Waihi, Tauranga, Whitianga (18)
MM1 Thames
? Tairua (21)

56/24 Jan 30d 10h 01m
MM3 Waihi (21), Thames, Tauranga.
? Tairua (21)

56/25 Jan 31d 07h 09m
MM4 Tuai

56/26 Feb 8d 10h 32m
MM3-4 Wanganui, Karori (68),
MM3 Dannevirke, Foxton (61), Paraparaumu (65) Greymouth
MM2-3 Titahi Bay (68)
MM2 Ohakune
MM1 Bunnythorpe (62)

56/27 Feb 8d 23h 13m
MM4 Gisborne

56/29 Feb 14d 14h 54m
MM3-4 Greymouth

56/31 Feb 17d 09h 43m
MM4 Blenheim

56/33 Feb 21d 01h 41m
MM3 Otira (93)
MM2-3 Greymouth

56/36 Feb 22d 21h 57m
MM2 Wellington

56/42 Mar 2d 02h 33m
MM4 Tokaanu

56/43 Mar 2d 07h 59m
MM3 Tokaanu

56/44 Mar 2d 11h 45m
MM3 Karori (68)

56/45 Mar 2d 22h 43m (See Isoseismal Map)
MM6-7 Tokaanu, Waihi (40)
MM5 Turangi (40), Hautu (40)
MM4 Rangipo (50), Otukou (50), Taurewa (50), Taumarunui-Tokaanu Highway (40), Roto Aira (50)
MM3 Taumarunui, Tongariro Fire Look Out (50)
MM2 Whangamomona
MM1 Ohakune, Tarawera (52)

56/50 Mar 5d 01h 21m
? Tokaanu

56/52 Mar 10d 20h 15m
MM4 Edievale (142)
MM2 Queenstown (132)

56/53 Mar 13d 17h 26m
MM2-3 Queenstown (132)

56/55 Mar 14d 14h 19m
? Auckland, Oneroa (17), Whitianga (18), Thames.

56/56 Mar 14d 14h 39m
? Thames

56/57 Mar 14d 15h 38m
? Auckland, Whitianga (18), Oneroa (17)

56/58 Mar 14d 15h 43m
MM3-4 Thames
? Auckland, Tairua (21), Oneroa (17), Whitianga (18)

56/59 Mar 14d 15h 48m
MM1-2 Thames

56/60 Mar 14d 16h 13m
MM4-5 Whitianga (18)
MM3-4 Thames
? Auckland, Tairua (21), Oneroa (17), Moko Hinau, Little Barrier Is. (14)

56/61 Mar 14d 16h 17m
? Auckland, Thames, Whitianga (18), Oneroa (17).

56/62 Mar 14d 19h 29m
MM1-2 Wellington

56/64 Mar 15d 17h 58m
MM1 Thames
? Great Barrier Is. (14)

56/65 Mar 16d 08h 40m
'Severe' Great Barrier Is. (14)
? Cuvier Is. (14), Moko Hinau, Auckland
MM1 Thames

56/67 Mar 16d 13h 44m
? Great Barrier Is. (14), Auckland
MM1 Thames

56/68 Mar 16d 14h 07m
MM1 Thames

56/69 Mar 17d 02h 09
MM1 Thames

56/70 Mar 17d 19h 24m
MM1 Thames

56/72 Mar 21d 15h 32m
MM3 Tokaanu

56/73 Mar 21d 18h 31m
MM3 Tokaanu

56/74 Mar 24d 16h 12m
MM3 Te Teko (34)

56/76 Mar 27d 02h 38m
MM5 Nelson (Met. Office)
MM4 Paraparaumu (65), Kelburn (68),
MM3-4 Nelson (P.O.), Thorndon (68),
MM3 New Plymouth, Rangikura (55), Eketahuna (66), Levin (65).
MM2 Dannevirke, Foxton (61), Murchison
MM1 Christchurch

56/81 Apr 7d 18h 04m
MM4 Pt Chevalier (16)
MM3 Titirangi (16), Gt. Barrier Is (14), Moko Hinau, Waiheke Is., Thames, Paeroa (21),
MM2 Parnell (16).
MM1 Mt Roskill (16).

56/90 Apr 8d 18h 28m
MM3 New Plymouth, Ohakune
MM2 Wellington, Farewell Spit (72)

56/97 Apr 19d 09h 30m
MM3 East Cape

56/101 Apr 29d 01h 11m
MM4 Wellington

56/102 May 1d 18h 19m
MM4-5 Wanganui

56/104 May 7d 10h 11m
MM2 Wellington

56/105 May 8d 23h 37m
MM3 Oamaru

56/108 May 21d 06h 29m
MM3 Queenstown (132)

56/109 May 23d 14h 59m
MM3-4 Wellington
MM3 Blenheim

56/112 May 29d 22h 58m
MM1 Paraparaumu (68)

56/115 Jun 13d 05h 42m
MM3 Milford Sound

56/116 Jun 14d 12h 13m
MM4-5 Wanganui
MM2 Wellington
MM1-2 Palmerston North

56/117 Jun 16d 19h 38m
? Farewell Spit (72)

56/118 Jun 17d 01h 08m
MM1-2 Cheviot

56/119 Jun 17d 03h 01m
MM2 Dannevirke

56/122 Jun 19d 18h 26m
MM4 Ohakune, Taumaranui, Whangamomona
MM2-3 New Plymouth

56/125 Jun 24d 22h 47m
MM2 Wellington

56/129 Jul 8d 02h 53m
MM3 Ohakune

56/132 Jul 9d 03h 28m
MM4 Awarua (154), Centre Is. (148), Nightcaps (140),
MM3 Tuatapere, Dog Is. (154)

56/133 Jul 15d 03h 59m
MM2 Wellington

56/135 Jul 17d 13h 29m
MM3 Tolaga Bay

56/136 Jul 20d 14h 23m
MM4 Haast

56/143 Aug 18d 11h 17m
MM1 Greymouth

56/144 Aug 19d 04h 57m
? Wanganui

56/145 Aug 20d 02h 39m
MM1 Eketahuna (66)

56/148 Aug 26d 11h 10m
MM1-2 Karori (68)

56/160 Sep 5d 21h 45m
MM1-2 Wellington

56/152 Sep 18d 06h 05m
MM2 Wellington

56/158 Sep 24d 04h 30m
MM4 Cheviot
MM2 Molesworth (89)

56/159 Sep 24d 15h 15m
MM4 Nelson
MM3 Paraparaumu (65)
MM2 Wellington

56/161 Oct 1d 04h 34m
MM4 Ohakune

56/164 Oct 10d 09 48m
MM1 Karori (68)

56/166 Oct 15d 03h 48m
MM3 Gisborne, Tolaga Bay

56/169 Oct 23d 22h 12m
MM1-2 Wellington

56/170 Nov 6d 03h 34m
MM3 Wairakei (41)

56/171 Nov 8d 22h 22m
MM1-2 Wellington

56/173 Nov 11d 22h 04m
MM1 Dannevirke

56/174 Nov 14d 07h 52m
MM3 Tadmore (75)

56/175 Nov 16d 14h 18m
MM4 Ohakune

56/177 Nov 20d 21h 28m
? Monowai

56/184 Dec 9d 11h 41m
MM3 Blenheim

56/186 Dec 18d 05 42m
MM1-2 Wellington

56/188 Dec 27d 05h 56m
? Omoana (56)

56/189 Dec 28d 14h 24m
MM7 Toatoa (36)
MM6 Opotiki, Motu
MM5 Matawai (36), Whakatane, Nuhaka (54)
MM4-5 Gisborne, Wairoa
MM4 East Cape, Tolaga Bay, Te Teko (34)
MM2 Palmerston N.
MM1 Taupo, Waipawa (60)

56/191 Dec 30d 05h 14m
MM3 Tolaga Bay
? Whakatane.

EARTHQUAKES FELT NEAR STATED LOCALITIES

The first figure following the locality name is the number of the epicentre, followed by the maximum intensity (in brackets) reported from the district covered by the locality name. The instrumental magnitude may be found from the epicentre list, and the places actually reporting the shock from the table of 'Places reporting felt earthquakes'.

93.	Arthur's Pass	33(3)				
16.	Auckland	21(3)	55(2)	58(3-4)	60(3-4)	
		61(3)	65(1)	67(1)	81(4)	
14.	Barrier Islands	21(4)	60(3)	64(1)	65(4)	
		67(1)	81(3)			
77.	Blenheim	31(4)	109(3)	184(3)		
154.	Bluff	132(4)				
61.	Bulls	6(3)	26(3)	76(2)		
50.	Chateau	8(2)	11(2)			
96	Cheviot	118(1-2)	158(4)			
110	Christchurch	6(2)	76(1)			
89	Clarence	158(2)				
18	Coromandel	21(4)	22(3)	58(2)	60(4-5)	
		61(2)				
63	Dannevirke	3(2)	4(2)	6(3)	26(3)	
		76(2)	119(2)	173(1)		

145	Dunedin	52(4)			
29	East Cape	97(3)	189(4)		
45	Gisborne	6(1)	27(4)	166(3)	189(4-5)
85	Greymouth	26(3)	29(3-4)	33(2)	143(1)
103	Haast	136(4)			
24	Hamilton	21(2)			
60	Hastings	189(1)			
55	Hawera	76(3)			
15	Helensville	21(1)			
30	Kawhia	21(1)			
132	Kingston	52(2)	53(2-3)	108(3)	
54	Mahia	189(5)			
66	Masterton	76(3)	145(1)		
25	Matamata	21(5)			
20	Mercer	21(3)			
120	Milford	115(3)			
11	Moko Hinau	60(3)	65(1)	(81)	
139	Monowai	177(2)			
140	Mossburn	132(4)			
36	Motu	89(5)			
75	Motueka	174(3)			
80	Murchison	76(2)			
34	Murupara	21(3)	74(3)		
52	Napier	14(2)	45(1)		
76	Nelson	6(3)	76(4-5)	159(4)	
47	New Plymouth	76(3)	90(3)	122(2-3)	
136	Oamaru	105(3)			
49	Ohakune	6(3)	26(2)	45(1)	90(3)
35	Opotiki	122(4)	129(3)	161(4)	175(4)
65	Otaki	21(5)	189(6)		
62	Palmerston N.	6(2)	76(4)	112(1)	159(3)
23	Raglan	6(3)	26(1)	116(1-2)	
33	Rotorua	21(2)			
142	Roxburgh	21(4)			
58	Taihape	52(4)			
72	Takaka	6(3)			
39	Taumarunui	90(2)	117(2)		
41	Taupo	122(4)	45(3)		
26	Tauranga	170(3)			
31	Te Kuiti	21(3)	22(3)	24(3)	
42	Te Whaiti	21(3)			
21	Thames	21(1)			
		21(4)	22(3)	24(3)	55(2)
		58(3-4)	59(1-2)	60(4-5)	61(3)
		65(1)	67(1)	69(1)	70(1)
40	Tokaanu	81(3)			
		42(4)	43(3)	45(6-7)	50(2)
32	Tokoroa	72(3)	73(3)		
37	Tolaga Bay	21(2)			
42	Tuai	21(3)	135(3)	166(3)	
148	Tuatapere	25(4)			
17	Waiheke	132(3)			
		21(3)	58(2)	60(3)	61(2)
		81(3)			
57	Wanganui	26(3-4)	102(4-5)	116(4-5)	144(2)
13	Warkworth	21(3)			
56	Waverley	188(2)			
68	Wellington	26(3-4)	36(2)	44(3)	62(1-2)
		76(3-4)	90(2)	101(4)	104(2)
		109(3-4)	116(2)	125(2)	133(2)
		148(1-2)	150(1-2)	151(2)	159(2)
		164(2)	169(1-2)	171(1-2)	181(1-2)
27	Whakatane	21(3)			
48	Whangamomona	45(2)	122(4)		

PUBLICATIONS

During the year, the following papers by members of the Seismological Observatory staff were published:

E - 133. Quarterly Seismic Bulletin 1953 July - Sept.

E - 134 Quarterly Seismic Bulletin 1953 Oct. - Dec.

S - 103 R.R. DIBBLE: Earthquake Risks in the Wellington Area N.Z. Science Review. Vol 14, No. 8, Aug 1956.

Geophysical Memoir No. 5:

G. A. EIBY: Crustal Structure Profile

R. R. DIBBLE: The Wellington Profile

G. A. EIBY: The Seismic Energy and Magnitude of the Explosion.

G. A. EIBY: The Pencarrow Profile.

MAPS

This bulletin contains the following maps

1. Epicentres of Normal Focus Earthquakes in 1956.
2. Epicentres of Deep Focus Earthquakes in 1956.
3. Isoseismals for the earthquake of 1956 Jan. 30.
4. Isoseismals for the earthquake of 1956 Mar. 2.

R. E. OWEN, GOVERNMENT PRINTER, WELLINGTON, NEW ZEALAND—1960