

SAINT LOUIS UNIVERSITY INSTITUTE OF TECHNOLOGY

3621 OLIVE STREET, SAINT LOUIS 8, MO., U. S. A.

SEISMOLOGICAL BULLETIN

Seismological Bulletin for the month of January, 1947

1.

No.	Date	Sta.	Phase	. Inst.	h m s	Remarks
1	January 3	S.L.	iPZ ipPZ	M.S. M.S.	00 18 06 00 18 19	Epicentral Region: 44°2' N., 148°0' E. H = 00h05m51s. h = 50±km. Δ _{P-H} = 82°4 Δ _{meas} = 82°4
2	January 3	S.L.	iPZ iZ iZ iSE eE	M.S. M.S. M.S. S. S.	02 29 25 02 29 32 02 29 45 02 39 42 02 46 13	Tentative Epicenter: 44°5' N., 149°1' E. H = 02h17m11s. Δ _{P-H} = 81°4 Δ _{meas} = 81°2 Probably deeper than normal.
3	January 3	S.L.	iPZ ipPZ iSE F	M.S. M.S. S. Lost in microseisms	00 32 50 00 33 02 02 43 00	Region of # 2. H = 02h20m40s. h = 50±km. Δ _{P-H} = 80°9 Δ _{meas} = 81°2
4	January 3	S.L.	iPZ ipPZ	M.S. M.S.	09 22 55 09 23 08	Aftershock of # 2. H = 09h10m46s. h = 50±km.
5	January 88	S.L.	eZ eZ	M.S. M.S.	19 45 32 19 45 43	
6	January 9	S.L.	iPZ iZ iSE iN	M.S. M.S. S. S.	12 28 27 12 28 37 12 38 30 12 38 42	Region of # 2. H = 12h16.1m Probably deeper than normal.
7	January 10	S.L.	iN iN	W.A. W.A.	18 59 37 18 59 52	Possibly Seismic. Time doubtful.
		Fl.	iE iE	W.A. W.A.	18 59 07 18 59 15	Possibly Seismic.
8	January 12	S.L.	eN	S.	04 20 29	
9	January 14	S.L.	ePZ eZ eE e(S)E eN F	M.S. M.S. S. S. S. S.	04 49(57) 04 50 42 04 55 04 04 59 39 05 00 00 05 12±	Kurile Islands?

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 Seismological Bulletin for the month of January, 1947 (Con't.)

No.	Date	Sta.	Phase	Inst.	h m s	Remarks		
9 (Con't.)	January 14	Fl.	iZ	G.W.	04 59 09			
			eZ	G.W.	05 01 19			
			eN	G.W.	05 01 47			
			F	G.W.	05 27±			
10	January 15	S.L.	iPZ	M.S.	18 32 49	Tentative Epicenter: 27°5 N., 111°6 W. H = 18 ^h 28 ^m 07 ^s . $\Delta_{P-H} = 20^{\circ}8$ $\Delta_{meas} = 20^{\circ}8$		
			iSN	S.	18 36 42			
			iLN	S.	18 38 49			
			F	S.	19 55±			
	Fl.	ePZ	G.W.	18 32 49	$\Delta_{P-H} = 20^{\circ}8$ $\Delta_{meas} = 20^{\circ}7$			
		eSN	G.W.	18 36 42				
		iLN	G.W.	18 39 22				
		F	G.W.	19 40±				
11	January 15	S.L.	iN	S.	20 06 13	Tonga Region?		
			eN	S.	20 08 50			
12	January 16	S.L.	ePZ	M.S.	15 28 57	Epicentral Region: 6°9 N., 82°1 W. H = 15 ^h 22 ^m 23 ^s . $\Delta_{P-H} = 32^{\circ}4$ $\Delta_{meas} = 32^{\circ}6$		
			iZ	M.S.	15 29 02			
			eSN	S.	15 34 20			
			eLN	S.	15 38 31			
			F	S.	16 02±			
13	January 20	S.L.	iPZ	M.S.	00 45 37	Marianna - Marshall Is.?		
14	January 20	S.L.	iPZ	M.S.	10 46 39	Epicentral Region: 28°N., 116°W. H = 10 ^h 41.7 ^m $\Delta_{P-H} = 22^{\circ}3$ $\Delta_{meas} = 22^{\circ}3$		
			iZ	M.S.	10 46 43			
			iSN	S.	10 50 44			
			iLN	S.	10 53 00			
			eMN	S.	10 54 50			
			F	S.	11 07±			
		Fl.	eSN	G.W.	10 50 46	$\Delta_{meas} = 22^{\circ}4$		
			eLN	G.W.	10 53 13			
			F	G.W.	11 04±			
15	January 20	S.L.	ePZ	M.S.	11 48 56	Aftershock of # 14. H = 11 ^h 43.9 ^m		
			iZ	M.S.	11 49 02			
			iSN	S.	11 52 58			
			iLN	S.	11 55 53			
		Fl.	eLN	G.W.	11 55 28			
16	January 21	S.L.	iPZ	M.S.	20 17 28	General Region: 22°8 S., 69°2 W. H = 20 ^h 07 ^m 01 ^s . $\Delta_{P-H} = 64^{\circ}5$ $\Delta_{meas} = 64^{\circ}8$ Region determined on basis of depth of focus of 100±km. Probably deeper. Very poor agreement of data!		
			iZ	M.S.	20 18 16			
			iZ	M.S.	20 19 42			
			eSN	S.	20 25 55			
			iSE	S.	20 26 07			
			iE	S.	20 27 19			
			F	S.	20 55±			

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 Seismological Bulletin for the month of January, 1947 (Con't.)

No.	Date	Sta.	Phase	Inst.	h m s	Remarks				
16 (Con't.)	January 21	Fl.	iPZ	G.W.	20 17 28	$\Delta_{P-H} = 64^{\circ}5$ $\Delta_{meas} = 65^{\circ}0$ No surface waves. Time doubtful.				
			iSE	G.W.	20 26 07					
			iE	G.W.	20 27 19					
17	January 23	S.L.	iPZ	M.S.	16 06 38	Tentative Epicenter: 52°0 N., 163°3 W. H = 15 ^h 57 ^m 40 ^s . $\Delta_{P-H} = 50^{\circ}7$ $\Delta_{meas} = 50^{\circ}9$				
			iZ	M.S.	16 06 44					
			iZ	M.S.	16 06 59					
			iE	S.	16 07 19					
			iPcPZ	M.S.	16 07 56					
			eSN	S.	16 13 52					
			eSR ₁ E	S.	16 17 35					
			eLE ₁	S.	16 21 27					
			eME	S.	16 25 25					
			F	S.	17 02±					
		Fl.	iPZ	G.W.	16 06 37		$\Delta_{P-H} = 50^{\circ}6$ $\Delta_{meas} = 50^{\circ}7$			
			eSE	G.W.	16 13 46					
			eLE	G.W.	16 21 28					
			eME	G.W.	16 25 30					
18	January 24	S.L.	eZ	M.S.	17 06 13	34°0N., 137°5 E., according to U.S.S.R. H = 16 ^h 47.8 ^m (B.C.I.S.)				
			e(SKS)N	S.	17 12 04					
			e(PS)N	S.	17 14 03					
			eLN	S.	17 27 28					
			F	S.	18 44±					
19	January 25	S.L.	iPZ	M.S.	03 17 00	Foreshock of # 21. H = 03 ^h 11.5 ^m				
			iSN	S.	03 21 34					
			iLN	S.	03 28 19					
			eMN	S.	03 32 57					
20	January 25	S.L.	iPZ	M.S.	03 56 17	Foreshock of # 21. H = 03 ^h 50.8 ^m				
			iFR ₁ Z	M.S.	03 56 47					
			iPR ₂ Z	M.S.	03 57 05					
			eSN	S.	04 00 53					
			eN	S.	04 01 31					
21	January 25	S.L.	iPZ	M.S.	03 58 08	Tentative Epicenter: 13°4 N., 87°5 W. H = 03 ^h 52 ^m 39 ^s . $\Delta_{P-H} = 25^{\circ}5$ $\Delta_{meas} = 25^{\circ}5$				
			iZ	M.S.	03 58 28					
			eSN	S.	04 02 34					
		Fl.	iPZ	G.W.	03 58 10					
			iSZ	G.W.	04 02 44					
			eLZ	G.W.	04 06 46					
			eMZ	G.W.	04 09 30					
			F	G.W.	05 43±					
			22	January 25	S.L.		iPZ	M.S.	04 52 27	Aftershock of # 21. H = 04 ^h 46.9 ^m
							eSN	S.	04 57 01	
			F	S.	05 56±					

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks	
23	January 26	S.L.	iPZ	M.S.	10 12 11	Tentative Epicenter: 13°5 N., 86°7 W. H = 10 ^h 06 ^m 46 ^s . Depth of Focus: about 75 km. $\Delta_{P-H} = 25^{\circ}5$ $\Delta_{meas} = 25^{\circ}5$	
			iPZ	M.S.	10 12 15		
			ipPZ	M.S.	10 12 23		
			iPR ₁ Z	M.S.	10 12 54		
			ipPR ₁ Z	M.S.	10 13 00		
			i(PcP)Z	M.S.	10 14 59		
			iSNE	S.	10 16 28		
			i(SR ₁)N	S.	10 17 43		
			F	S.	12 29±		
			Fl.	iPZ	G.W.		10 12 15
		iPR ₁ Z		G.W.	10 12 55		
		iZ		G.W.	10 13 37		
		iSE		G.W.	10 16 41		
				F	G.W.		12 15±
24	January 26	S.L.	iPZ	M.S.	14 08 28	General Region Probably: 50°2 N., 157°4 E. Using H = 13 ^h 57.0 ^m	
			iZ	M.S.	14 08 37		
25	January 27	S.L.	e(P)Z	M.S.	01 14 21	Central America?	
			e(S)N	S.	01 18 26		
			eN	S.	01 19 46		
			eN	S.	01 24 22		
			eN	S.	01 27 43		
			F	S.	01 44±		
		Fl.	e(S)N	G.W.	01 18 32		
			eE	G.W.	01 21 38		
			F	G.W.	01 39±		
26	January 28	S.L.	i(P')Z	M.S.	10 42 04	Tentative Epicenter: 20°S., 66°5 E. H = 10 ^h 22.0 ^m , according to B.C.I.S.	
			eLE	S.	11 43 11		
			eMN	S.	11 53 11		
			F	S.	11 59±		
		Fl.	eLE	G.W.	11 44 10		
27	January 28	S.L.	iZ	M.S.	19 10 20	Possibly Seismic.	
28	January 29	S.L.	iPZ	M.S.	08 28 00	Tentative Epicenter: 27°0 S., 62°8 W. H = 08 ^h 17 ^m 50 ^s . h = 600±km. $\Delta_{P-H} = 70^{\circ}2$ $\Delta_{meas} = 70^{\circ}6$	
			iZ	M.S.	08 28 11		
			iPcPZ	M.S.	08 28 19		
			i(pP)Z	M.S.	08 30 18		
			iSFZ	M.S.	08 31 14		
			ipPR ₁ Z	M.S.	08 32 35		
			iSEN	S.	08 36 20		
			iScSEN	S.	08 37 07		
			isSN	S.	08 39 50		
			i(sPS)N	S.	08 40 24		
			i(sSP)Z	M.S.	08 40 34		
			eSR ₁ N	S.	08 41 39		
			i(sSR ₁)N	S.	08 44 33		
			F	S.	09 35±		

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5.

No.	Date	Sta.	Phase	Inst.	h m s	Remarks
28 (Con't.)	January 29	Fl.	iPZ	G.W.	08 28 04	$\Delta_{P-H} = 70^{\circ}8$ $\Delta_{meas} = 70^{\circ}8$
			ePcPZ	G.W.	08 28 24	
			ipPZ	G.W.	08 30 02	
			esPZ	G.W.	08 30 24	
			ipPR ₁ E	G.W.	08 31 48	
			iSEN	G.W.	08 36 26	
			iScSEN	G.W.	08 37 11	
			esSE	G.W.	08 38 56	
			esPSE	G.W.	08 39 49	
			eSR ₁ N	G.W.	08 40 48	
			esSR ₁ E	G.W.	08 43 38	
			e(SR ₂)E	G.W.	08 44 03	
			F	G.W.	09 07±	

MINOR SEISMIC ACTIVITY

Date	Sta.	G.M.T. <u>From</u>	G.M.T. <u>To</u>	Remarks
January 17	S.L.	00h31m	00h58m	Strong microseisms present.
January 20	Fl.	16 34	16 38	Possibly surface.
January 20	Fl.	21 29	21 35	Possibly surface.

James B. Macelwane, S. J.
Director

Vincent D. Mackle
Student Assistant

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SYMBOLS AND STATION CONSTANTS



CG—CAPE GIRARDEAU (in cooperation with Southeast Missouri State Teachers College, Cape Girardeau, Mo., U. S. A.)
— (inaugurated, 1938)

Latitude: geographical, $37^{\circ}19'N$; geocentric, $37^{\circ}08'N$.
Longitude: $89^{\circ}32'W$. Altitude: $h = 134m$, $H+h = 4km$.
Lithologic foundation: limestone.
Seismographs: Wood-Anderson short period EN.
Director of the Station: Professor John Harty.

FL—FLORISSANT (in cooperation with Saint Stanislaus Seminary, Florissant, Missouri, U. S. A.)—(inaugurated, 1928)

Latitude: geographical, $38^{\circ}48'06''N$; geocentric, $38^{\circ}37'N$.
Longitude: $90^{\circ}22'12''W$. Altitude: $h = 160m$, $H+h = 4km$.
Lithologic foundation: Pennsylvanian shale.
Seismographs: Galitzin-Wilip ENZ, Wood-Anderson short period EN.
Clock: Shortt synchronome.
Director of the Station: Reverend James B. Macelwane, S. J.

LR—LITTLE ROCK (in cooperation with Saint John's Seminary, Pulaski Heights, Little Rock, Arkansas, U. S. A.)—(inaugurated, 1930).

Latitude: geographical, $34^{\circ}47'N$; geocentric, $34^{\circ}36'N$.
Longitude: $92^{\circ}21'W$. Altitude: $h = 135m$, $H+h = 5 km$.
Lithologic foundation: sandstone.
Seismographs: Wood-Anderson short period EN.
Clock: Howard-Gaertner.
Director of the Station: Monsignor Joseph A. Murray.

SL—SAINT LOUIS I, Administration Building of Saint Louis University, 221 North Grand Boulevard — (inaugurated, January 1, 1910).

Latitude: geographical, $38^{\circ}38'11''N$; geocentric, $38^{\circ}27'N$.
Longitude: $90^{\circ}14'00''W$. Altitude: $h = 160m$, $H+h = 4 km$.
Lithologic foundation: clay.
Seismograph: Wiechert (80 kg) EN.
Clock: Wiechert.

II, University Gymnasium, 3672 West Pine Boulevard — (inaugurated, 1927).

Latitude: geographical, $38^{\circ}38'10''N$; geocentric, $38^{\circ}27'N$.
Longitude: $90^{\circ}14'10''W$. Altitude: $h = 161m$, $H+h = 4 km$.
Lithologic foundation: Mississippian limestone.
Seismographs: Wood-Anderson short period EN.
Macelwane-Sprengnether Z; Sprengnether NE.
Clock: Wiechert.
Director: Reverend James B. Macelwane, S.J.

SAINT LOUIS UNIVERSITY INSTITUTE OF TECHNOLOGY

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
29	February 2	S.L.	ePZ iZ	M.S. M.S.	01 47 15 01 47 36	Time Uncertain.
30	February 2	S.L.	e(P)Z eLN F	M.S. S. S.	01 13 24 04 27.5 05.3	
		Fl.	eLN F	G.W. G.W.	04 28 -- 05.0	
31	February 3	S.L.	iPZ ipPZ	M.S. M.S.	16 51 08 16 51 53	9°3 S., 76°0 W. H = 16 ^h 42 ^m 40 ^s . Depth of Focus: ±200 km. $\Delta_{P-H} = 49^{\circ}4$ $\Delta_{meas} = 49^{\circ}9$
		Fl.	iPZ	G.W.	16 51 09	$\Delta_{P-H} = 49^{\circ}5$ $\Delta_{meas} = 50^{\circ}0$
32	February 4	S.L.	iPZ eZ	M.S. M.S.	23 51 08 23 54 25	Time Uncertain.
33	February 5	S.L.	eZ	M.S.	06 17 34	Time Uncertain.
34	February 5	S.L.	i(P)Z	M.S.	17 54 10	Time Uncertain.
35	February 6	S.L.	(eP)Z i(P)Z	M.S. M.S.	08 06 02 08 06 08	Time Uncertain.
36	February 7	S.L.	(e)Z eP'Z ePR ₁ Z i(pPR ₁)Z iSN isSN iE eSR ₁ N i(SR ₂)N eLN F	M.S. M.S. M.S. M.S. S. S. S. S. S. S. S. S.	08 58 04 08 59 01 08 59 37 08 59 51 09 07 26 09 07 49 09 09 28 09 15.1 09 19 25 09 32.4 11.4	10°1 S., 161°9 E. H = 08 ^h 40 ^m 40 ^s . Depth of Focus: 50+km. $\Delta_{PR_1-H} = 110^{\circ}5$ $\Delta_{meas} = 110^{\circ}3$
		Fl.	eE eLN F	G.W. G.W. G.W.	09 09.3 09 32 -- 11.5	
37	February 8	S.L.	eLN	S.	10 52 --	
		Fl.	eLE	G.W.	10 54 --	

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7.

No.	Date	Sta.	Phase	Inst.	h m s	Remarks
38	February 8	S.L.	ePZ iZ eLN	M.S. M.S. S.	11 01 02 11 02 09 11 08 --	
		Fl.	eLE	G.W.	11 10 --	
39	February 8	S.L.	eLN	S.	11 50 --	
		Fl.	eLE	G.W.	11 52 --	
40	February 8	S.L.	eLN	S.	12 06.5	
		Fl.	eLE	G.W.	12 08 --	
41	February 8	S.L.	eLE M F	S. S. S.	18 22.5 18 24.5 Lost	
		Fl.	M	G.W.	18 24.2	
42	February 9	S.L.	ePZ iZ iSE iE E F	M.S. M.S. S. S. S. S.	04 39 37 04 39 43 04 47 21 04 49 24 04 52.5 05.7	Region: 17°S., 75°W. H = 04 ^h 29.9 ^m $\Delta P-H = 56^{\circ}8$
		Fl.	iN eE F	G.W. G.W. G.W.	04 47 26 04 49.4 05.4	
43	February 10	S.L.	e(L)E F	S. S.	04 52.5 06.5	
		Fl.	eLE F	G.W. G.W.	04 47 -- 06.1	
44	February 11	S.L.	ePZ	M.S.	18 47 56	
45	February 11	S.L.	ePZ	M.S.	21 24 26	
46	February 13	S.L.	iPZ	M.S.	00 23 22	South America?
47	February 13	S.L.	iPZ	M.S.	16 48 29	
48	February 15	S.L.	iPZ iSE e(L)E F	M.S. S. S. S.	01 16 50 01 24 03 01 36 -- Lost	Time Uncertain.
		Fl.	ePZ iSE	G.W. G.W.	01 16 51 01 24 02	
49	February 15	S.L.	eZ	M.S.	08 35 10	

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
50	February 16	S.L.	iPZ	M.S.	02 20 41	16°8 N., 97°1 W. H = 02 ^h 15 ^m 48 ^s . h = 80 ⁺ km. $\Delta P-H = 22^{\circ}6$ $\Delta_{meas} = 22^{\circ}7$ Surface waves very small.
			iZ	M.S.	02 20 43	
			epPZ	M.S.	02 20 57	
			iZ	M.S.	02 21 09	
			iSN	S.	02 24 45	
			iSE	S.	02 24 47	
			isSE	S.	02 25 17	
			F	S.	Lost	
		Fl.	iPZ	G.W.	02 20 43	Time Uncertain.
			iZ	G.W.	02 21 20	
iSN	G.W.		02 24 46			
isSE	G.W.		02 25 21			
51	February 18	S.L.	iPZ	M.S.	13 43 09	Epicentral Region: 32°7 N., 137°3 E. H = 13 ^h 30 ^m 29 ^s . h = 450 ⁺ km. $\Delta P-H = 96^{\circ}0$ $\Delta_{meas} = 96^{\circ}4$
			epPZ	M.S.	13 44 48	
			iSKSN	S.	13 53 04	
			isSKSN	S.	13 56 06	
			isSN	S.	13 56 51	
			eE	S.	13 59 40	
			iE	S.	14 01 24	
			i(sSR ₁)E	S.	14 03 22	
			iE	S.	14 09 25	
			F	S.	Lost	
		Fl.	iPR ₁ Z	G.W.	13 47 09	$\Delta_{meas} = 96^{\circ}2$
			ipPR ₁ Z	G.W.	13 48 35	
			iSKSE	G.W.	13 53 02	
			esSE	G.W.	13 56 51	
F	G.W.	14.7				
52	February 21	Fl.	eLE	G.W.	22 49 --	
			F	G.W.	23.2	
53	February 22	Fl.	eLE	G.W.	02 29 --	
54	February 22	Fl.	eLE	G.W.	04 23 --	
F	G.W.	04.8				
55	February 24	S.L.	epZ	M.S.	17 41 14	La Paz gives epicenter at: 15°30'S., 68°45'W.
			iPZ	M.S.	17 41 16	
			iZ	M.S.	17 41 22	
			iZ	M.S.	17 43 13	
			iSE	S.	17 49 06	
		Fl.	eE	W.A.	17 41 27	
			iSE	G.W.	17 49 11	
			iE	G.W.	17 51 00	
			eMN	G.W.	18 03 --	
			F	G.W.	18.5	

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks	
56	February 26	S.L.	iPZ	M.S.	01 56 23	Epicentral Region: 11° N., 88.95 W. H = 01h50m06s. $\Delta P-H = 27.2$ $\Delta_{meas} = 27.2$	
			iZ	M.S.	01 56 42		
			iSN	S.	02 01 13		
			L	S.	02 06 --		
			F	S.	Lost		
		Fl.	ePN	W.A.	01 56 23		$\Delta P-H = 27.2$
			iSN	G.W.	02 01 19		$\Delta_{meas} = 27.93$
			L	G.W.	02 06 --		
			F	G.W.	02.5		
57	February 26	S.L.	e(P)Z	M.S.	05 54 03		
58	February 27	S.L.	e(P)Z	M.S.	20 08 26		
59	February 28	S.L.	e(P)Z	M.S.	06 12 16		

MINOR SEISMIC ACTIVITY

Date	Station	G.M.T. <u>From</u>	G.M.T. <u>To</u>	Remarks
February 4	S.L.	07 ^h 03 ^m	07 ^h 5 ^m	Also at Florissant.
February 10	S.L.	11.1	11.5	Seismic?
February 12	S.L.	21.1	21.7	
February 19	S.L.	07 55	08 16	Also at Florissant.

James B. Macelwane, S. J.
Director

Paul E. Howe
Student Assistant

SAINT LOUIS UNIVERSITY
INSTITUTE OF TECHNOLOGY

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10.

No.	Date	Sta.	Phase	Inst.	h m s	Remarks	
60	March 1	S.L.	i(P)ZN iZ	M.S. M.S.	03 30 36 03 30 51		
		Fl.	e(P)NE	W.A.	03 30 36		
61	March 1	S.L.	i(P)Z iZ	M.S. M.S.	03 36 03 03 36 18	Replica of # 60.	
62	March 1	S.L.	iPZN	M.S.	21 31 31	Time doubtful!	
		Fl.	ePNE	W.A.	21 31 31		
63	March 2	S.L.	ePKPZ	M.S.	19 28 16	Epicenter: 5°45', 144°05' E. NE New Guinea. H = 19h09m25s. $\Delta ePKP-H = 120^{\circ}5$ $\Delta_{meas} = 120^{\circ}6$	
			iPR ₁ ZE	M.S.	19 29 44		
			iE	S.	19 29 59		
			iN	S.	19 30 04		
			iSKSE	S.	19 35 10		
			ISKKSNE	S.	19 36 39		
			iPSE	S.	19 39 40		
			iPSN	S.	19 39 46		
			i(SR ₁)N	S.	19 45 55		
			FN	S.	21 08 --		
		Fl.	i(PR ₁)ZE	G.W.	19 29 56		$\Delta iSKS-H = 120^{\circ}4$ $\Delta_{meas} = 120^{\circ}4$
			iSKSE	G.W.	19 35 10		
			iSKKSE	G.W.	19 36 34		
			iPSE	G.W.	19 39 32		
	i(SR ₁)EN	G.W.	19 46 32				
	FE	G.W.	21 37 --				
64	March 6	S.L.	iZE	M.S.	19 05 48	Probably not seismic!	
			iN	S.	19 06 06		
			iZ	M.S.	19 06 21		
			iE	S.	19 06 24		
65	March 7	S.L.	eZ	M.S.	04 37 38		
			iE	S.	04 42 31		
			iN	S.	04 45 41		
			FE	S.	04 59 --		
		Fl.	eE	G.W.	04 42 18		
			FE	G.W.	04 55 --		
66	March 7	S.L.	eZ	M.S.	16 59 08		
			eZ	M.S.	16 59 49		

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
67	March 8	S.L.	iPZ iZ	M.S. M.S.	09 12 02 09 12 13	
68	March 8	S.L.	e(P)Z iZ	M.S. M.S.	15 09 57 15 10 08	
69	March 8	S.L.	iPZ iZ iZ	M.S. M.S. M.S.	15 26 00 15 26 04 15 26 23	
70	March 9	S.L.	iE iZ F	S. M.S. M.S.	15 43 12 15 43 42 15 45 --	Time doubtful!
71	March 9	S.L.	iZ iZ	M.S. M.S.	21 31 20 21 32 07	
72	March 10	S.L.	ePZ eE eLE FE	M.S. S. S. S.	02 06 06 02 17 24 02 35 46 02 45 --	Epicentral Region: 10°5 S., 119°6 W. SE of Ascension Island. H = 01h53m17s. $\Delta_{eP-H} = 88^{\circ}3$ $\Delta_{meas} = 88^{\circ}3$
73	March 10	S.L.	iPZ iZ FE	M.S. M.S. S.	04 26 06 04 26 17 04 51 --	Time doubtful!
74	March 11	S.L.	e(P)Z iZN iN	M.S. M.S. W.A.	11 14 56 11 15 10 11 15 19	Time doubtful!
75	March 11	S.L.	i(P)Z iZ	M.S. M.S.	17 19 00 17 19 03	Time doubtful!
76	March 11	S.L.	iZ iZ iZ eZ	M.S. M.S. M.S. M.S.	23 09 53 23 09 56 23 10 24 23 10 28	Time very doubtful!
77	March 12	S.L.	iPZ iZ	M.S. M.S.	09 28 49 09 29 05	Time very doubtful!
78	March 14	S.L.	iPZN	M.S.	23 00 15	
79	March 15	S.L.	iPZ	M.S.	05 37 39	
80	March 15	S.L.	ePZ iZ i(L)NE FN	M.S. M.S. S. S.	08 16 31 08 16 46 08 22 59 08 29 --	Pasadena: Mexico?
		Fl.	e(L)NE i(L)N FNE	G.W. G.W. G.W.	08 22 40 08 23 04 08 28 --	

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
81	March 15	S.L.	ePZ	M.S.	14 15 41	Epicentral Region: 15°N., 92°W. Pacific coast of Guatemala. H = 14 ^h 10.5 ^m h = 50±km.
			iPZ	M.S.	14 15 43	
			ipPZ	M.S.	14 16 01	
			i(S)N	S.	14 20 03	
			i(SR ₁)E	S.	14 20 43	
			FN	S.	14 27 --	
		Fl.	e(S)E	G.W.	14 19 49	
			i(sS)E	G.W.	14 20 09	
			i(SR ₁)E	G.W.	14 20 52	
		FE	G.W.	14 27 --		
82	March 17	S.L.	iPZ	M.S.	06 36 49	
			iZ	M.S.	06 37 07	
83	March 17	S.L.	eZ	M.S.	08 37 27	Epicenter: 33°3 N., 98°8 E. SE Chinghai Prov., China H = 08 ^h 19 ^m 37 ^s . Pasadena: Magn.: 7 1/4 Δ _{iPR₁} -H = 108°4 Δ _{meas} = 108°2
			ePR ₁ Z	M.S.	08 38 24	
			iZ	M.S.	08 40 30	
			iPR ₂ Z	M.S.	08 40 45	
			iSKSEN	S.	08 44 45	
			iSE	S.	08 46 09	
			iPSE	S.	08 47 39	
			iN	S.	08 47 55	
			iPPSN	S.	08 48 39	
			iE	S.	08 49 10	
			iPPPSE	S.	08 49 32	
			iE	S.	08 51 13	
			iE	S.	08 52 03	
			iE	S.	08 52 57	
			iSR ₁ E	S.	08 53 35	
			iE	S.	08 54 23	
FN	S.	11 24 --				
84	March 17	S.L.	i(P)Z	M.S.	16 42 22	
			iZ	M.S.	16 43 02	
85	March 17	S.L.	e(P)Z	M.S.	22 09 02	
86	March 18	S.L.	ePZ	M.S.	05 58 04	
87	March 18	S.L.	iPZ	M.S.	15 29 26	Epicentral Region: 19°N., 108°W. In Pacific Ocean between Cape Corrientes, Mexico and Raville Gigedo Islands. H = 15 ^h 24.0 ^m
			iZ	M.S.	15 29 41	
			iPR ₁ Z	M.S.	15 29 58	
			iSE	S.	15 34 03	
			iN	S.	15 34 25	
			iSR ₁ E	S.	15 34 42	
			i(L)NE	S.	15 37 21	
			i(M)NE	S.	15 39 11	
			FN	S.	15 43 --	
38	March 20	S.L.	iPZ	M.S.	10 36 38	
			iZ	M.S.	10 36 47	

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
89	March 21	S.L.	iPZ	M.S.	16 37 32	Pacific Ocean off Chile. Possibly deeper than normal!
			i(pP)Z	M.S.	16 37 50	
			iZ	M.S.	16 37 59	
90	March 21	S.L.	i(P)Z	M.S.	23 12 37	Pasadena: Pacific?
			eN	S.	23 38 18	
91	March 22	S.L.	iPZ	M.S.	09 52 09	Epicentral Region: 20°6 S., 72°2 W. Pacific Ocean, SW of Iquique, Chile. H = 09h41m55s. Possibly deeper than normal! $\Delta_{iP-H} = 61^{\circ}8$ $\Delta_{meas} = 61^{\circ}8$
			iZ	M.S.	09 52 20	
			iZ	M.S.	09 52 40	
			iPcPZ	M.S.	09 53 04	
			iSE	S.	10 00 34	
			i(S)Z	M.S.	10 00 47	
			iN	S.	10 01 37	
			eE	S.	10 01 44	
			F	S.	10 04 --	
			Fl.	ePE	W.A.	
		iSE		G.W.	10 00 32	
		FE		G.W.	10 02 --	
		92	March 23	S.L.	iPZ	M.S.
ipPZ	M.S.				01 23 12	
eZ	M.S.				01 23 32	
ePR ₁ Z	M.S.				01 23 42	
i(S)N	S.				01 27 02	
iSR ₁ E	S.				01 28 10	
isSR ₁ E	S.				01 28 50	
iE	S.				01 31 00	
iN	S.				01 31 10	
F	S.				01 40 --	
93	March 23	S.L.	iPZ	M.S.	10 00 20	
94	March 24	S.L.	iPZ	M.S.	16 50 31	
			Fl.	iPNE	W.A.	16 50 28
95	March 25	S.L.	ePR ₁ N	S.	20 51 44	Epicenter: 38°8 S., 178°3 E. SE of Mahia Penin., North Island, New Zealand. H = 20h32m15s. Magni. : 6 1/2 to 6 3/4, according to Pasadena. $\Delta_{eP-H} = 114^{\circ}1$ $\Delta_{meas} = 114^{\circ}2$ Two huge tidal waves caused destruction along a sixty-mile stretch of islands east coast at Poverty Bay. No drownings reported.
			iE	S.	20 55 13	
			iSKSE	S.	20 57 44	
			iE	S.	20 58 05	
			iSKKSE	S.	20 58 46	
			iSN	S.	20 59 39	
			iPSN	S.	21 01 16	
			iPPSE	S.	21 02 18	
			iE	S.	21 05 09	
			iE	S.	21 06 13	
			iSR ₁ E	S.	21 07 42	
			F	S.	00 05 --	

R.C.I.S.: Felt with intensity IV in region of Gisborne and north of Hawkes Bay.

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
95 (Con't.)	March 25	Fl.	e(PR ₁)Z	G.W.	20 51 37	$\Delta_{ePPS-H} = 113.97$ $\Delta_{meas} = 114.01$
			eE	G.W.	20 58 01	
			eSE	G.W.	20 59 41	
			eE	G.W.	21 01 03	
			iPPSZ	G.W.	21 02 19	
			eSR ₁ E	G.W.	21 07 49	
			F	G.W.	23 34 --	
96	March 26	S.L.	i(P)Z	M.S.	08 44 13	Time doubtful
			iZ	M.S.	08 44 22	
		Fl.	ePE	W.A.	08 44 03	
97	March 29	S.L.	e(P)N	W.A.	17 49 11	
			eN	W.A.	17 52 50	
98	March 29	S.L.	ePZ	M.S.	18 14 14	
99	March 29	S.L.	ePZ	M.S.	18 49 02	
			eZ	M.S.	18 52 57	
		Fl.	eNE	W.A.	18 53 02	
100	March 30	S.L.	ePZ	M.S.	03 38 17	

MINOR SEISMIC ACTIVITY

Date	Station	G.M.T. <u>From</u>	G.M.T. <u>To</u>	Remarks
March 10	Fl.	02h33m	02h42m	
March 10	Fl.	04 37	04 41	
March 16	S.L.	10 34	10 56	Masked by microseisms.
March 16	Fl.	10 43	10 52	
March 23	Fl.	01 32	01 36	
March 25	S.L.	03 14	03 31	$\Delta_t = 01m37s$
March 27	S.L.	20 04	20 31	
March 27	Fl.	20 04	20 23	
March 29	S.L.	08 15	08 24	
March 29	Fl.	08 16	08 22	

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks				
101	April 1	Fl.	ePN	W.A.	14 27 05	Region: 18°S., 68°W. h = 150±km. H = 14h17.3m				
			eSN	W.A.	14 35 03					
			isSN	G.W.	14 35 54					
			F	Lost changing records						
102	April 1	S.L.	ePZ	M.S.	19 30 15	Time Uncertain.				
103	April 2	Fl.	eP'Z	G.W.	05 58 10	1.8 S., 138°3 E. H = 05h39m16s. ΔPR ₁ -H = 122°5 Δ _{meas} = 122°4				
			iPR ₁ Z	G.W.	05 59 44					
			iSKSE	G.W.	06 05 09					
			iSKKSE	G.W.	06 06 43					
			e(S)E	G.W.	06 07 46					
			iPSE	G.W.	06 09 51					
			iLN	G.W.	06 36 10					
			F	G.W.	09.2					
104	April 10	S.L.	iPZ	M.S.	16 02 55	Pasadena: 34°58'N., 116°32'W. H = 15h58m04s. Magnitude 6.8				
			iZ	M.S.	16 03 30					
			iSN	S.	16 06 53					
			i(PcP)Z	M.S.	16 06 59					
			iZ	M.S.	16 07 11					
			iLE	W.A.	16 09 09					
			iMZ	M.S.	16 11 13					
			F	S.	20 -- --					
		Fl.	iPZ	G.W.	16 02 56					
			iZ	G.W.	16 03 01					
			iSN	G.W.	16 06 52					
			F	G.W.	20 -- --					
			105	April 10	S.L.		ePZ	M.S.	17 21 13	Aftershock of # 104.
			eME	W.A.	17 29 27					
F	S.	Lost								
106	April 13	S.L.	iPZ	M.S.	02 57 54	Region: 30°S., 72°W. H = 02h47.0m h = 50+km. S.L. time Uncertain.				
			ipPZ	M.S.	02 58 07					
			iSN	S.	03 07 04					
			i(sS)N	S.	03 07 33					
			F	S.	03.7					
107	April 13	Fl.	iPZ	G.W.	07 27 54	44.0 N., 119°7 E. H = 07h15m46s. h = 50±km. ΔP-H = 81°0 Δ _{meas} = 81°1				
			ipPZ	G.W.	07 28 09					
			iSN	G.W.	07 38 02					
			isSN	G.W.	07 38 24					
			F	G.W.	Lost					
				G.W.	Lost					

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
108	April 17	S.L.	ePnN	W.A.	19 51 42.0	Local Quake. $\Delta_{Sn-Pn} = 176$ miles. $\Delta_{S^*-P^*} = 183$ miles.
			iN	W.A.	19 51 43.0	
			iZ	M.S.	19 51 43.0	
			eSnN	W.A.	19 52 13.5	
			iS*Z	M.S.	19 52 18.0	
		Fl.	e(Pn)N	W.A.	19 51 42.0	
			iP*N	W.A.	19 51 45.7	
			e(Sn)N	W.A.	19 52 12.5	
			iS*N	W.A.	19 52 15.3	
			iN	W.A.	19 52 20.7	
			i(Sg)N	W.A.	19 52 22.9	
			iN	W.A.	19 52 25.6	
109	April 20	S.L.	ePZ	M.S.	05 07 36	Time \pm 3 sec.
110	April 23	S.L.	ePZ	M.S.	04 54 31	19°2 N., 70°5 W. H = 04 ^h 48 ^m 56 ^s . $\Delta_{P-H} = 26^{\circ}0$ $\Delta_{meas} = 26^{\circ}0$ Another shock?
			eSN	S.	04 58 53	
			eE	S.	04 59 13	
			e(P)Z	M.S.	04 59 34	
			eSR ₁ N	S.	04 59 52	
			eLE	S.	05 01.6	
			F	S.	05.5	
111	April 24	S.L.	eLE	S.	05 00 40	
			iME	S.	05 01 37	
			F	S.	05.3	
112	April 24	S.L.	ePZ	M.S.	19 44 46	7°6 N., 39°0 W. H = 19 ^h 35 ^m 14 ^s . Possibly deeper than normal. $\Delta_{P-H} = 55^{\circ}5$ $\Delta_{meas} = 55^{\circ}2$
			iPZ	M.S.	19 44 47	
			iSN	S.	19 52 18	
			iN	S.	19 52 36	
			iSR ₁ N	S.	19 56 06	
			F	S.	23 -- --	
113	April 26	S.L.	ePZ	M.S.	13 24 42	Region: 16°N., 101°W. H = 13 ^h 19 ^m 24 ^s .
			eSN	S.	13 28 55	
			eE	S.	13 29 15	
			eLN	S.	13 31 43	
			iME	S.	13 33 10	
			F	S.	08.0	
114	April 27	S.L.	ePZ	M.S.	08 07 55	
			e(S)N	S.	08 12 08	
			e(M)N	S.	08 18 18	
			F	S.	09.1	
115	April 27	S.L.	e(P)Z	M.S.	22 26 02	Time Uncertain.
116	April 30	S.L.	e(P)Z	M.S.	04 57 09	Region: 59°N., 139°W. H = 04 ^h 49.8 ^m $\Delta_{meas} = 36^{\circ}9$ S.L. Time Uncertain.
			eE	W.A.	05 07 43	
			i(L)N	S.	05 09 52	
			F	S.	06.5 \pm	

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
117	April 30	S.L.	ePZ e(L)N F	M.S. S. S.	17 23 29 17 40 41 18 -- --	Very roughly: 30°N., 30°W. H about 17 ^h 14.5 ^m

MINOR SEISMIC ACTIVITY

Date	Station	G.M.T. From	G.M.T. To	Remarks
April 2	Fl.	21 ^h 14 ^m	22 ^h 36 ^m	Also at S.L.
April 19	S.L.	21 --	22.5	Surface.
April 27	S.L.	11 27	11 40	Surface (Near)
April 29	S.L.	07.4	08 --	Surface
April 29	S.L.	09 --	09.5	Surface

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
118	May 2	S.L.	ePZ iPZ eSN eN (L) F	M.S. M.S. S. S. S. S.	01 36 06 01 36 09 01 40 21 01 41 04 01 45 -- 02.4	14°8 N., 94°9 W. H = 01 ^h 30 ^m 50 ^s . $\Delta P-H = 24^{\circ}1$ $\Delta_{meas} = 24^{\circ}3$
119	May 2	S.L.	iPZ ipPZ iZ iSN isSN eN i(ScS)N eSR ₁ N L F	M.S. M.S. M.S. S. S. S. S. S. S. S. S.	02 28 01 02 28 13 02 28 23 02 35 13 02 35 33 02 36.7 02 37 46 02 39 -- 02 43.3 04.4	53°8 N., 164°3 W. H = 02 ^h 19 ^m 06 ^s . h = 50±km. $\Delta P-H = 50^{\circ}7$ $\Delta_{meas} = 51^{\circ}0$ Pasadena: Magnitude - 6.
120	May 2	S.L.	iPZ iSN	M.S. S.	08 36 55 08 44 00	
121	May 3	S.L.	iPZ iZ ePR ₁ E eSKSE iSKKSE e(S)E eE eSPE e(PKKP)E eL F	M.S. M.S. S. S. S. S. S. S. S. S. S.	09 48 43 09 48 56 09 52 26 09 59 11 09 59 42 10 00 04 10 00 10 10 01 13 10 05 52 10 21 06 Lost	B.C.I.S. gives: 35°5 N., 141°0 E. H = 09 ^h 35 ^m 27 ^s . Off east coast of Honshu, Japan.
122	May 5	S.L.	ePZ eZ iSN	M.S. M.S. S.	05 04 41 05 04 44 05 08 43	Time Uncertain. Surface waves small.
123	May 6	S.L.	iPZ epPZ eZ eZ eSN eSR ₁ N	M.S. M.S. M.S. M.S. S. S.	01 12 05 01 12 34 01 12 48 01 13 01 01 21 21 01 25 57	Time Uncertain. No surface waves.

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
124	May 6	S.L.	eP'Z iZ iPR ₂ Z eN iSKSE iSKKSE iPSE eSR ₁ N eSR ₂ N F	M.S. M.S. M.S. S. S. S. S. S. S. S.	20 49 21 20 50 36 20 52 59 20 54 26 20 56 23 20 57 42 21 00 01 21 05.7 21 10.7 00.5	Epicentral Region: 6°5 S., 149°0 E. H = 20h30m35s. $\Delta P-H = 118^{\circ}2$ $\Delta_{meas} = 118^{\circ}0$
125	May 6	S.L.	eE iE i(S)E iE	W.A. W.A. W.A. W.A.	21 27 14 21 27 24 21 27 31 21 27 33	Local?
126	May 7	S.L.	ePZ	M.S.	06 04 15	
127	May 8	S.L.	eLE F	S. S.	07 32 -- 07.8	
128	May 8	S.L.	eP ₁ 'Z	M.S.	19 03 50	B.C.I.S.: 24°1/2 N., 95°1/5 E. Burma. H = 18h45.0 ^m
129	May 8	S.L.	iPZ iZ eN iSZ iSR ₁ E iLE F	M.S. M.S. S. M.S. S. S. S.	24 00 00 24 00 07 24 01 27 24 05 41 24 07 47 24 10 35 24 43 --	Epicenter: 3°3 N., 95°2 W. NW of the Galapagos. H = 23h53m00s. Possibly deeper than normal. $\Delta iP-H = 35^{\circ}5$ $\Delta_{meas} = 35^{\circ}7$
		Fl.	ePZ eSE eSR ₁ E eSR ₂ E eE .F	G.W. G.W. G.W. G.W. G.W. G.W.	24 00 11 24 05 55 24 07 57 24 08 22 24 08 45 24 40 --	$\Delta eSR_2-H = 35^{\circ}7$ $\Delta_{meas} = 35^{\circ}8$
130	May 9	S.L.	iPZ iZ iPR ₁ Z iSNE eLN	M.S. M.S. M.S. W.A. W.A.	13 37 38 13 37 42 13 37 57 13 41 45 13 43 08	Epicenter: 17°4 N., 90°0 W. Guatemala. H = 13h32m50s. $\Delta iP-H = 21^{\circ}3$ $\Delta_{meas} = 21^{\circ}3$
		Fl.	ePZ eSNE eN eLE	G.W. G.W. G.W. W.A.	13 37 44 13 41 52 13 42 02 13 43 05	$\Delta eP-H = 21^{\circ}9$ $\Delta_{meas} = 21^{\circ}5$

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks		
131	May 11	S.L.	eZ eN	M.S. S.	05 17 37 05 18 05	Pasadena: 34°14'N., 116°20'W. O = 05 ^h 06 ^m 20 ^s . Felt strongly near Twenty-nine Palms. Magnitude - 4.9 $\Delta_{\text{meas}} = 21^{\circ}6$		
		Fl.	eN	G.W.	05 17 33		$\Delta_{\text{meas}} = 21^{\circ}4$	
132	May 11	S.L.	ePZ F	M.S. S.	06 44 24 07 49 --	B.C.I.S.: 39°1 N., 16°9 E. H = 06 ^h 32 ^m 21 ^s . Seismic destruction in Calabre, Italy. Felt at Ischia, Iona, Badolato and Santa Catarina. $\Delta_{\text{meas}} = 78^{\circ}2$ Time doubtful.		
133	May 11	S.L.	eP ₁ 'Z F ₁	M.S.	18 59 41 Lost	Epicenter: 5°3 S., 110°7 E. NE of Karimoendjowo Is., Java Sea. Time doubtful. $\Delta_{\text{meas}} = 142^{\circ}1$		
		Fl.	eP ₁ 'Z F ₁	G.W. G.W.	18 59 39 20 49 --		$\Delta_{\text{eP}'-H} = 142^{\circ}4$ Time doubtful. $\Delta_{\text{meas}} = 142^{\circ}0$	
134	May 14	S.L.	ePZ iZ	M.S. M.S.	05 59 16 06 00 26	Within continental limits of U.S. Southeastern Appalachians?		
		Fl.	ePN	W.A.	05 59 18			
135	May 15	S.L.	e(P)Z	M.S.	20 10 43			
136	May 17	S.L.	eZ	M.S.	07 25 56	Epicenter: 38°3 S., 176°7E. West of Gisborne, North Is., New Zealand. H = 07 ^h 06 ^m 48 ^s . $\Delta_{\text{eSP-H}} = 115^{\circ}1$ $\Delta_{\text{meas}} = 115^{\circ}1$		
			eN	S.	07 26 05			
			ePR ₁ Z	M.S.	07 26 23			
			eN	S.	07 29 18			
			eSKSEN	S.	07 32 18			
			eSKKSE	S.	07 33 18			
			eSE	S.	07 34 14			
			ePSN	S.	07 35 52			
			eSPZ	M.S.	07 36 04			
			eSR ₁ E	S.	07 42 10			
			e(SR ₂)N	S.	07 47 23			
			F	S.	10 19 --			
			Fl.	eZ	G.W.		07 26 12	$\Delta_{\text{eSKS-H}} = 115^{\circ}2$ $\Delta_{\text{meas}} = 115^{\circ}0$
				ePR ₁ Z	G.W.		07 26 26	
				eSKSE	G.W.		07 32 16	
				eSKKSE	G.W.		07 33 16	
eFSE	G.W.	07 35 56						
eSPZ	G.W.	07 36 00						
eSR ₁ Z	G.W.	07 42 20						
eSR ₂ EN	G.W.	07 46 42						
F	G.W.	10 14 --						

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks	
137	May 18	S.L.	eZ	M.S.	01 53 32	Pasadena: Tonga region. h = 550 km.	
			eE	S.	01 53 49		
			F	S.	02 00 --		
		Fl.	eN	S.	01 53 36		
			eN	S.	01 53 58		
			F	S.	01 58.5		
138	May 22	S.L.	ePZ	M.S.	11 17 51		
139	May 23	S.L.	ePZ	M.S.	05 11 46	Epicenter: 19°9 S., 68°4 W. Bolivian-Chilian border NE of Iquique. H = 05 ^h 01 ^m 43 ^s . h = 150±km. $\Delta_{eP-H} = 62^{\circ}2$ $\Delta_{meas} = 62^{\circ}2$	
			epPZ	M.S.	05 12 17		
			eSE	W.A.	05 19 53		
			eSZ	M.S.	05 19 57		
140	May 24	S.L.	ePZ	M.S.	18 18 08	Mexico.	
			iZ	M.S.	18 18 20		
		Fl.	eN	W.A.	18 18 17		
			eN	G.W.	18 27 47		
141	May 25	S.L.	ePZ	M.S.	16 04 18	Epicenter: 51°8 N., 168°4 W. South of Umnak Is., Aleutians. H = 15 ^h 54 ^m 58 ^s . h = 50±km. $\Delta_{eP-H} = 54^{\circ}3$ $\Delta_{meas} = 54^{\circ}3$	
			epPZ	M.S.	16 04 31		
			F	S.	16 58 --		
		Fl.	ePE	W.A.	16 04 17		$\Delta_{eP-H} = 54^{\circ}1$
			epPZ	G.W.	16 04 30		$\Delta_{meas} = 54^{\circ}1$
			F	G.W.	16 54 --		
142	May 26	S.L.	iPZ	M.S.	00 11 49	Epicenter: 15°4 N., 92°4 W. Pacific coast of Chiapas near Guatemalan border. H = 00 ^h 06 ^m 47 ^s . h = 75±km. Time doubtful! $\Delta_{eS-H} = 23^{\circ}7$ $\Delta_{meas} = 23^{\circ}5$	
			ipPZ	M.S.	00 12 05		
			isPZ	M.S.	00 12 13		
			iPR ₁ Z	M.S.	00 12 25		
			eSN	S.	00 16 05		
			esSZ	M.S.	00 16 33		
		Fl.	F	S.	00 34 --		$\Delta_{eP-H} = 23^{\circ}5$
			ePZ	G.W.	00 11 52		$\Delta_{meas} = 23^{\circ}6$
			epPZ	G.W.	00 12 08		
			eSE	G.W.	00 16 06		
			esSZ	G.W.	00 16 34		
			eSR ₁ Z	G.W.	00 17 02		
143	May 26	S.L.	eFZ	M.S.	06 05 03	Time doubtful! Aftershock.	
			epPZ	M.S.	06 05 17		
			eFR ₁ Z	M.S.	06 05 39		
			epPR ₁ Z	M.S.	06 05 56		

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
143 (Con'd)	May 26	Fl.	ePN epPN	W.A. W.A.	06 05 05 06 05 20	
144	May 26	S.L. Fl.	ePZ epPZ ePR ₁ Z ePN epPN	M.S. M.S. M.S. W.A. W.A.	06 25 30 06 25 47 06 26 08 06 25 33 06 25 49	Time doubtful! Aftershock.
145	May 26	S.L. Fl.	iPZ eSN F ePN	M.S. S. W.A.	13 12 43 13 22 24 Lost 13 12 36	Epicenter: 46°3 N., 150°5 E. Urup Island, Kuriles. H = 13 ^h 00 ^m 56 ^s . h = 200±km. ΔeS-H = 79°6 Time doubtful. Δmeas = 79°6 ΔeP-H = 79°1 Δmeas = 79°4
146	May 26	S.L. Fl.	eZ eE eSN eZ F eSKSE iNE eZ F	M.S. W.A. S. M.S. G.W. G.W. G.W. G.W.	20 01 10 20 05 34 20 06 22 20 09 27 Lost 20 04 20 20 05 33 20 08 15 20 49 --	Epicenter: 8°6 S., 157°8 E. New Georgia, Solomon Is. h = 550±km. ΔeS-H = 113°1 Δmeas = 112°9 ΔeSKS-H = 112°9 Δmeas = 112°8
147	May 27	S.L. Fl.	e(P')Z epP'Z iSKPZ esSKPN F e(P')Z epP'Z eZ eSKPZ esSKPE	M.S. M.S. M.S. S. G.W. G.W. G.W. G.W.	03 54 28 03 54 38 03 57 31 03 58 13 Lost 03 54 25 03 54 38 03 56 49 03 57 31 03 58 12	Epicentral Region: 4°6 S., 123°4 E. Sawoe Sea, W of Timor. H = 03 ^h 34 ^m 57 ^s . h = 100±km. ΔiSKP-H = 138°4 Δmeas = 138°6 Time doubtful! ΔeSKP-H = 138°4 Δmeas = 138°4
148	May 27	S.L.	eZ eP'Z iPR ₁ Z iZ iZ iSKPZ i(PR ₂)N eSN	M.S. M.S. M.S. M.S. M.S. M.S. S. S.	06 17 49 06 17 55 06 19 44 06 20 02 06 20 23 06 20 39 06 20 49 06 21 41 06 27 35	Epicenter: 2°6 S., 141°0 E. Humboldt Bay, New Guinea. H = 05 ^h 59 ^m 14 ^s . ΔeS-H = 121°9 Δmeas = 121°3 Time doubtful!

(Continued on next page)

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
148 (Con'd)	May 27	S.L.	ePSN	S.	06 29 47	$\Delta_{eSR_1-H} = 120^{\circ}7$ $\Delta_{meas} = 121^{\circ}1$
			eN'	S.	06 30 13	
			iSR ₁ N	S.	06 35 59	
			iN	S.	06 39 38	
			eSR ₂ N	S.	06 40 28	
			F	S.	10 04 --	
		Fl.	eP'Z	G.W.	06 18 05	
			ePR ₁ Z	G.W.	06 19 37	
			iZ	G.W.	06 19 52	
			iZ	G.W.	06 20 04	
			iZ	G.W.	06 20 22	
			iSKPZ	G.W.	06 20 47	
			ePR ₂ Z	G.W.	06 21 58	
			eSE	G.W.	06 27 33	
			ePSZ	G.W.	06 29 38	
			eE	G.W.	06 30 12	
			ePPPSE	G.W.	06 31 46	
			eSR ₁ E	G.W.	06 36 02	
			ePFSSN	G.W.	06 36 34	
			iZ	G.W.	06 37 14	
e(SR ₂)E	G.W.	06 41 22				
F	G.W.	09 25 --				
149	May 27	S.L.	eZ	M.S.	17 53 44	Very weak - Indefinite beginning.
		Fl.	eNE	G.W.	17 53 53	
150	May 27	S.L.	ePZ	M.S.	21 04 21	J.S.A.: 40°2 N., 123°8 W. H = 20h58m44s. $\Delta_{eP-H} = 26^{\circ}2$ $\Delta_{meas} = 26^{\circ}2$ Berkeley: Felt over wide area of about 2400 square miles. N to Trinidad, E to Hooper, S to Ft. Bragg. Max. intensity of VI in Honeydew and Upper Mattole.
			iPZ	M.S.	21 04 23	
			ePR ₁ Z	M.S.	21 04 56	
			eSE	W.A.	21 08 58	
			e(SR ₁)N	S.	21 10 21	
			i(M)N	S.	21 13 27	
		F	S.	21 29 --		
		Fl.	ePE	G.W.	21 04 20	
			eSE	G.W.	21 08 50	
			e(M)Z	G.W.	21 13 18	
F	G.W.		21 21 --			
151	May 28	S.L.	eZ	M.S.	04 28 56	May not be seismic
152	May 28	S.L.	eE	W.A.	15 05 29	Epicenter: 29°1 S., 177°6 W. Kermadec Islands H = 14h47m57s. h = 100-km. $\Delta_{meas} = 106^{\circ}0$
			e(pPR ₁)Z	M.S.	15 06 34	
			F	S.	16 13 --	

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks	
152 (Con'd)	May 28	Fl.	eN	G.W.	15 03 51	$\Delta_{\text{meas}} = 105^{\circ}9$	
			e(PR ₁)Z	G.W.	15 06 10		
			e(pPR ₁)E	W.A.	15 06 34		
			e(sSKS)EN	G.W.	15 12 52		
			F	G.W.	16 10 --		
153	May 29	S.L.	iP'Z	M.S.	03 55 42	Possibly: $0^{\circ}7$ S., $109^{\circ}1$ E. SW of Pontinak, Borneo. Insufficient data for certainty. $H = 03^{\text{h}}36^{\text{m}}26^{\text{s}}$. $h = 75^{\pm}$ km. $\Delta_{\text{iP}'-H} = 138^{\circ}4$ $\Delta_{\text{meas}} = 138^{\circ}4$	
			ipP'Z	M.S.	03 55 56		
			esSKPE	W.A.	03 59 36		
		Fl.	eP'N	W.A.	03 55 43		Very weak! $\Delta_{\text{eP}'-H} = 138^{\circ}8$ $\Delta_{\text{meas}} = 138^{\circ}2$
			epP'E	W.A.	03 55 57		
			F	G.W.	04 44 --		
154	May 31	S.L.	eZ	M.S.	22 56 14	Weak local quake? Time doubtful.	
		Fl.	eN	W.A.	22 56 12		
			eN	W.A.	22 56 28		

MINOR SEISMIC ACTIVITY

Date	Station	G.M.T. From	G.M.T. To	Remarks
May 8	S.L.	07 ^h 32 ^m	07 ^h 8 ^m	
May 9	Fl.	19 48	20 04	Time doubtful
May 9	S.L.	19 46	20 05	Time doubtful
May 11	Fl.	07 12	07 32	
May 11	S.L.	23 08	23 18	
May 11	Fl.	23 07	23 18	
May 12	S.L.	10 57	11 29	
May 12	Fl.	11 04	11 12	
May 14	S.L.	03 05	03 30	
May 14	Fl.	03 06	03 31	
May 22	S.L.	09 13	09 44	
May 22	Fl.	09 14	09 26	
May 29	S.L.	23 22	23 43	
May 29	Fl.	23 29	23 40	
May 30	Fl.	00 26	00 29	

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SEISMOLOGICAL BULLETIN



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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
155	June 1	S.L.	ePZ eSN F.	M.S. S. S.	11 30 54 11 41 05 13.0	Epicentral Region: 36°1 N., 22°4 E. H = 11 ^h 18 ^m 35 ^s . (Using "Seismological Tables" by H. Jeffreys and K. E. Bullen, 1940.) S.L. time doubtful. $\Delta_{\text{meas}} = 82^{\circ}3$
156	June 4	S.L.	ePZ iPZ iZ	M.S. M.S. M.S.	00 42 16 00 42 18 00 42 22	40°1 N., 23°9 E. H = 00 ^h 29 ^m 50 ^s . $\Delta_{\text{meas}} = 81^{\circ}1$
157	June 5	S.L.	ePZ iPZ ipPZ eSN iSN isSN F	M.S. M.S. M.S. S. S. S. S.	23 03 34 23 03 36 23 03 54 23 07 58 23 08 08 23 08 39 24.0	13°8 N., 89°9 W. H = 22 ^h 58 ^m 18 ^s . h = 100 [±] km. $\Delta_{\text{P-H}} = 24^{\circ}9$ $\Delta_{\text{meas}} = 24^{\circ}9$
158	June 7	S.L.	eP'Z ePR ₁ Z	M.S. M.S.	19 06 39 19 08 06	11°9 N., 124°1 E. H = 18 ^h 47 ^m 58 ^s . $\Delta_{\text{PR}_1\text{-H}} = 119^{\circ}7$ $\Delta_{\text{meas}} = 120^{\circ}0$ N-S, E-W Sprengnether not operating.
159	June 9	S.L.	ePZ eZ eLN F	M.S. M.S. S. S.	06 19 21 06 19 35 06 30 29 06.9	
160	June 10	S.L.	iPZ iZ eZ eZ eSE eN F	M.S. M.S. M.S. M.S. S. S. S.	19 49 04 19 49 08 19 50 38 19 50 54 19 55 58 19 59 24 21.0	39°5 N., 28°8 W. H = 19 ^h 40 ^m 35 ^s . $\Delta_{\text{P-H}} = 46^{\circ}6$ $\Delta_{\text{meas}} = 46^{\circ}6$
161	June 11	S.L.	(e)Z eZ	M.S. M.S.	02 36 40 02 37 09	Time uncertain.

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
162	June 12	S.L.	iP'Z	M.S.	09 21 30	1°0 N., 126°5 E. H = 09h02m34s. h = 100±km. $\Delta_{PR_1-H} = 128^{\circ}0$ $\Delta_{meas} = 128^{\circ}0$
			ipP'Z	M.S.	09 21 46	
			iZ	M.S.	09 22 24	
			iPR ₁ Z	M.S.	09 23 34	
			ipPR ₁ Z	M.S.	09 23 54	
			iSKPN	S.	09 24 52	
			ipSKPN	S.	09 25 17	
			ePR ₂ N	S.	09 25 54	
			iSKKSN	S.	09 30 32	
			e(S)N	S.	09 31 04	
			e(sS)N	S.	09 31 32	
			e(PS)E	S.	09 33 56	
			i(pPS)Z	M.S.	09 34 48	
			ePPSE	S.	09 35 05	
			ipPPSN	S.	09 35 28	
			ePPPSE	S.	09 36 22	
			eSR ₁ E	S.	09 39 15	
			e(sSR ₁)E	S.	09 39 57	
			F	S.	12.5	
			Fl.	eP'Z	G.W.	
		iP'Z		G.W.	09 21 35	
		ipP'Z		G.W.	09 21 42	
		iPR ₁ Z		G.W.	09 23 30	
		ipPR ₁ Z		G.W.	09 23 55	
		iSKPE		G.W.	09 24 55	
		iE		G.W.	09 25 06	
		ipSKPE		G.W.	09 25 15	
		ePR ₂ E		G.W.	09 25 51	
		iZ		G.W.	09 26 52	
		iZ		G.W.	09 27 09	
		eZ		G.W.	09 27 56	
		eSE		G.W.	09 31 40	
		eE		G.W.	09 32 10	
		isSE		G.W.	09 32 26	
ePSE	G.W.	09 33 33				
iE	G.W.	09 34 03				
i(PPS)Z	G.W.	09 34 54				
iZ	G.W.	09 35 54				
iPPPSZ	G.W.	09 36 34				
iZ	G.W.	09 36 57				
F	G.W.	12.0				
163	June 13	S.L.	ePZ	M.S.	20 38 36	21°6 N., 115°6 E. H = 20h24m50s. $\Delta_{P-H} = 100^{\circ}1$ $\Delta_{meas} = 100^{\circ}8$ Possibly deeper than normal.
			eZ	M.S.	20 38 40	
			iZ	M.S.	20 38 57	
			iZ	M.S.	20 39 03	
			iPR ₁ Z	M.S.	20 42 52	
			eSKSN	S.	20 49 19	
			iSE	S.	20 49 33	
			iPSE	S.	20 51 55	
			F	S.	Lost	

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
163 (Con'd.)	June 13	Fl.	iPZ	G.W.	20 38 40	$\Delta_{P-H} = 100^{\circ}8$ $\Delta_{meas} = 100^{\circ}8$
			iZ	G.W.	20 38 52	
			iPR ₁ Z	G.W.	20 42 52	
			iSKSE	G.W.	20 49 16	
			iSE	G.W.	20 49 30	
			iPSE	G.W.	20 51 48	
			F	G.W.	Lost	
164	June 13	S.L.	e(P)Z	M.S.	21 49 59	Aftershock?
165	June 13	S.L.	e(P)Z	M.S.	21 53 38	Aftershock?
166	June 13	S.L.	ePZ	M.S.	24 04 10	Aftershock, # 163. H = 23 ^h 50 ^m 25 ^s .
			e(PR ₁)Z	M.S.	24 07 48	
			eSKSN	S.	24 14 39	
			ePSE	S.	24 17 13	
		F	S.	02.3		
		Fl.	eSKSE	G.W.	24 14 42	
			ePSE	G.W.	24 17 16	
F	G.W.		02.4			
167	June 14	S.L.	e(P)Z	M.S.	00 44 33	Aftershock, # 163. B.C.I.S.: H = 00 ^h 30 ^m 8
			e(PR ₁)Z	M.S.	00 48 38	
168	June 14	S.L.	e(PR ₁)Z	M.S.	16 47 56	Aftershock # 163.
			e(SKSN)	S.	16 54 07	
			F	S.	18.6	
169	June 15	S.L.	eN	W.A.	05 43 25	Local.
		Fl.	iN	W.A.	05 43 30	
170	June 16	S.L.	e(P)Z	M.S.	21 24 06	
171	June 18	S.L.	ePZ	M.S.	11 07 07	Aleutians?
			eZ	M.S.	11 07 14	
			eZ	M.S.	11 08 14	
172	June 19	S.L.	(ePR ₁)Z	M.S.	02 32 31	Aftershock, # 163. B.C.I.S.: H = 02 ^h 14 ^m 6
			eN	S.	02 44 23	
			e(SR ₁)N	S.	02 46 43	
			eN	S.	02 49 54	
			e(L)N	S.	02 55.7	
			F	S.	04.3	
173	June 19	S.L.	ePZ	M.S.	07 48 25	21 ^o 7 N., 145 ^o 2 E. H = 07 ^h 34 ^m 39 ^s . Possibly h = 50 km. $\Delta_{P-H} = 100^{\circ}1$ $\Delta_{meas} = 100^{\circ}5$
			i(P)Z	M.S.	07 48 34	
			ePR ₁ Z	M.S.	07 52 30	
			iSKSN	S.	07 59 01	
			iN	S.	07 59 19	
			iPSN	S.	08 01 39	
			F	S.	11 -- --	

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
174	June 19	S.L.	ePZ e(pP)Z eN F	M.S. M.S. S. S.	10 29 51 10 30 00 10 48 38 Lost	
175	June 19	S.L.	ePZ e(pP)Z iN eZ eSN iSN e(sS)N F	M.S. M.S. S. M.S. S. S. S. S.	22 54 19 22 55 15 22 55 47 22 56 53 22 59 39 22 59 52 23 01 35 24 -- --	May be 3°5' N., 101°7' W. with H = 22 ^h 47 ^m 44 ^s . and h = 300 ⁺ km.
176	June 20	S.L.	ePZ eE eSE eLE F	M.S. S. S. S. S.	13 41 53 13 43 26 13 48 04 13 51.3 Lost changing records.	31°2' N., 143°1' W. H = 13 ^h 34 ^m 32 ^s . Saint Louis time doubtful. $\Delta_{P-H} = 38^{\circ}2$ $\Delta_{S-P} = 39^{\circ}4$ $\Delta_{meas} = 39^{\circ}0$
177	June 20	S.L.	ePZ eSE F	M.S. S. S.	17 12 34 17 18 43 18 -- --	Aftershock # 176.
178	June 20	S.L.	ePZ eSN eLN F	M.S. S. S. S.	22 42 47 22 46 53 22 49 58 23.2	Region: 21°N., 106°W. H = 22 ^h 37 ^m 47 ^s .
179	June 20	S.L.	iPZ eSN F	M.S. S. S.	23 17 56 23 24.8 24.1	Aftershock # 160 H = 23 ^h 09 ^m 27 ^s .
180	June 22	S.L.	e(P)Z	M.S.	01 23 31	May not be seismic.
181	June 22	S.L.	ePZ e(S)N F	M.S. S. S.	11 48 08 11 52 34 12.4	
182	June 22	S.L.	(eP)Z eSN iMN F	M.S. S. S. S.	23 35 02 23 39 34 23 43 09 Lost	Indefinite. Reported felt in the San Francisco Area.
183	June 25	S.L.	iPZ ipPZ	M.S. M.S.	16 48 15 16 48 30	
184	June 25	S.L.	ePZ e(S)N iN eLE F	M.S. S. S. S. S.	22 55 10 22 59.3 23 00 20 23 06 06 23.7	Central America?

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
185	June 26	Fl.	Local earthquake recorded at 14 ^h , G.M.T. Δ Sn-Pn = 156 miles. Records at St. Louis were being changed.			
186	June 30	S.L.	iP*E iE iS*N	W.A. W.A. W.A.	04 23 58.4 04 24 00.9 04 24 02.0	Local Quake. Absolute time not available at Florissant. See, Ross R. Heinrich, "The Mississippi Valley Earthquake of June 30, 1947", Bull. Seis. Soc. America, v. 40, n. 1, pp. 7-19, 1950.

MINOR SEISMIC ACTIVITY

Date	Station	G.M.T. From	G.M.T. To	Remarks
June 7	S.L.	06 ^h -- ^m	07 ^h -- ^m	Weak Surface
June 10	S.L.	12.5	14.5	Weak Surface
June 15	S.L.	21 10	21 50	Weak Surface
June 16	S.L.	10 43	12 00	Weak Surface
June 18	S.L.	00 35 03 40	01 10 04 20	Distant Surface Distant Surface
June 22	S.L.	18 27	19 50	Distant Surface

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SEISMOLOGICAL BULLETIN

Seismological Bulletin for the month of July, 1947

30.

No.	Date	Sta.	Phase	Inst.	h m s	Remarks
187	July 7	S.L.	iPZ	M.S.	22 47 56	Epicentral Region: 37°3 N., 20°2 E. H = 22 ^h 35 ^m 42 ^s . $\Delta_{P-H} = 81.2$ $\Delta_{meas} = 81.1$
188	July 8	S.L.	ePZ	M.S.	05 25 24	Time doubtful.
189	July 10	S.L.	iPZ iZ	M.S. M.S.	10 55 47 10 56 01	Epicentral Region: 72°2 N., 69°0 W. H = 10 ^h 48 ^m 52 ^s . $\Delta_{P-H} = 34.9$ $\Delta_{meas} = 35.1$
190	July 10	S.L.	iPZ ipPZ iSN isSN F	M.S. M.S. S. S. S.	16 10 26 16 10 43 16 14 50 16 15 20 19.3	Epicentral Region: 13.9 N., 92.9 W. H = 16 ^h 05 ^m 10 ^s . h = 100 [±] km. $\Delta_{P-H} = 24.9$ $\Delta_{meas} = 24.9$
191	July 12	S.L.	iPZ ipPZ eSE isSN F	M.S. M.S. W.A. S. S.	02 11 08 02 11 22 02 21 14 02 21 38 04.5	Epicentral Region: 44°2 N., 149°0 E. H = 01 ^h 58 ^m 58 ^s . h = 75 [±] km. $\Delta_{P-H} = 82.0$ $\Delta_{meas} = 81.8$
		Fl.	ePN epPN iSE isSE F	W.A. W.A. G.W. G.W. G.W.	02 11 06 02 11 20 02 21 11 02 21 32 02 56 --	$\Delta_{P-H} = 81.3$ $\Delta_{meas} = 81.5$
192	July 12	S.L.	iPZ iSN iSR ₁ N F	M.S. S. S. S.	12 43 17 12 54 44 13 01 19 Post	Region: 21°S., 174°W. H = 12 ^h 29 ^m 39 ^s . $\Delta_{P-H} = 98.7$ $\Delta_{meas} = 98.6$
		Fl.	ePZ eSKSE iSKKSE eSN iSN F	G.W. G.W. G.W. G.W. G.W. G.W.	12 43 18 12 53 50 12 54 23 12 54 46 12 54 49 15.5	$\Delta_{P-H} = 98.5$ $\Delta_{meas} = 98.5$

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks	
193	July 13	S.L.	iPZ	M.S.	06 26 10	Mexico.	
			iZ	M.S.	06 26 19		
			eSN	S.	06 30 23		
			F	S.	07.0		
		Fl.	ePZ	G.W.	06 26 13		
			eSE	G.W.	06 30 25		
			F	G.W.	07.0		
194	July 13	S.L.	ePZ	M.S.	13 11 00	Region: 20°S., 176°W. H = 12 ^h 57 ^m 40 ^s . h = 150 [±] km. $\Delta_{S-P} = 99^{\circ}4$ $\Delta_{meas} = 99^{\circ}4$	
			epPZ	M.S.	13 11 30		
			iSN	S.	13 22 22		
			esSN	S.	13 23 17		
			eN	S.	13 26 13		
			F	S.	Lost		
195	July 16	S.L.	iPZ	M.S.	11 30 11	Epicentral Region: 16.7 S., 70.5 W. H = 11 ^h 20 ^m 33 ^s . h = 150 [±] km. $\Delta_{P-H} = 58^{\circ}5$ $\Delta_{meas} = 58^{\circ}5$	
			eZ	M.S.	11 30 22		
196	July 16	S.L.	ePZ	M.S.	15 37 04	Region: 19.5 S., 65.0 W. H = 15 ^h 27 ^m 07 ^s . h = 250 [±] km. $\Delta_{P-H} = 62^{\circ}9$ $\Delta_{meas} = 62^{\circ}9$	
			epPZ	M.S.	15 37 54		
		Fl.	eZ	G.W.	15 38 53		$\Delta_{S-H} = 63^{\circ}5$ $\Delta_{meas} = 63^{\circ}1$
			iSE	G.W.	15 45 19		
197	July 16	S.L.	ePZ	M.S.	16 46 50		
			iPZ	M.S.	16 46 51		
198	July 16	S.L.	ePR ₁ Z	M.S.	19 38 09	Region: 31°N., 135°E. H = 19 ^h 20 ^m 29 ^s . $\Delta_{PR_1-H} = 99^{\circ}2$ $\Delta_{meas} = 99^{\circ}2$	
			eN	S.	19 45 09		
			F	S.	Lost		
		Fl.	e(P)Z	G.W.	19 34 14		$\Delta_{(P)-H} = 99^{\circ}7$ $\Delta_{meas} = 99^{\circ}0$
			eZ	G.W.	19 38 03		
			eE	G.W.	19 45 28		
		F	G.W.	21.3			
199	July 20	S.L.	ePZ	M.S.	10 44 11		
			eN	S.	10 57 12		
			eN	S.	10 57 30		
			F	S.	Lost		

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
200	July 20	S.L.	e(S)N	S.	12 42 33	Near Apia.
			e(PPS)N	S.	12 44 32	
			eN	S.	12 45 18	
			e(SR ₁)N	S.	12 49 29	
			F	S.	Lost	
Fl.	eE	G.W.	12 41 31			
	e(S)N	G.W.	12 42 31			
201	July 21	S.L.	iPZ	M.S.	04 16 08	
202	July 21	S.L.	ePZ	M.S.	09 49 09	Epicentral Region: 39°9 N., 20°9 E. H = 09 ^h 37 ^m 03 ^s . Δ _{P-H} = 79°8 Δ _{meas} = 79°8
			eZ	M.S.	09 49 25	
203	July 21	S.L.	eP'Z	M.S.	10 16 17	Epicentral Region: 10°2 S., 118°4 E. H = 10 ^h 56 ^m 50 ^s . Δ _{meas} = 142°2
			eZ	M.S.	10 16 33	
204	July 23	S.L.	eE	W.A.	05 19 17	Epicentral Region: 16°8 N., 68°1 W. H = 05 ^h 13 ^m 23 ^s . Δ _{S-H} = 29°5 Δ _{meas} = 29°5 Δ _{SR₁-H} = 29°9 Δ _{meas} = 29°7
			eSN	W.A.	05 24 32	
			eLN	S.	05 27.5	
			F	S.	Lost	
			Fl.	(e)N	G.W.	
		(e)N		G.W.	05 24 32	
		eN		G.W.	05 24 52	
		eSR ₁ Z		G.W.	05 26 09	
		eLN		G.W.	05 26.8	
		F	G.W.	06.8		
205	July 23	S.L.	iPR ₁ Z	M.S.	17 32 08	Epicentral Region: 55°3 S., 28°5 W. H = 17 ^h 13 ^m 22 ^s . Δ _{PR₁-H} = 108°2 Δ _{meas} = 108°2 Δ _{P-H} = 107°7 Δ _{meas} = 108°3
			iSN	S.	17 39 37	
			ePSN	S.	17 41 38	
			iSR ₁ N	S.	17 47 11	
			eLN	S.	17 53.6	
			F	S.	20.6	
			Fl.	ePZ	G.W.	
		eZ		G.W.	17 31 09	
		iPR ₁ Z		G.W.	17 32 06	
		eSKSE		G.W.	17 38 18	
		iSKKSE		G.W.	17 39 12	
		eSR ₁ N		G.W.	17 47 09	
		iSR ₁ N		G.W.	17 47 13	
		eLN		G.W.	18 02.9	
		F	G.W.	20.3		

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks			
206	July 24	S.L.	ePR ₁ Z	M.S.	08 58 29	Aftershock of # 205 . Epicentral Region: 55°5 S., 30°0 W. H = 08 ^h 39 ^m 51 ^s . $\Delta_{P-H} = 107^{\circ}2$ $\Delta_{meas} = 107^{\circ}3$			
			eSE	S.	09 06 12				
			eSR ₁ E	S.	09 13 38				
			e(SR ₂)E	S.	09 18 14				
			eLE	S.	09 30.3				
			F	S.	Lost				
		Fl.	eZ	G.W.	08 58 34		$\Delta_{S-H} = 106^{\circ}7$		
			eZ	G.W.	09 05 26		$\Delta_{meas} = 107^{\circ}4$		
			iSE	G.W.	09 06 12				
			iSR ₁ E	G.W.	09 13 39				
			eLN	G.W.	09 26.1				
			F	G.W.	Lost				
			<hr/>						
			207	July 24	S.L.		ePR ₁ Z	M.S.	12 35 54
e(PR ₂)Z	M.S.	12 38 37							
eSKS	S.	12 41 56							
eSKKS	S.	12 43 02							
eSN	S.	12 43 46							
iPSE	S.	12 45 16							
iSR ₁ N	S.	12 51 16							
iSR ₂ E	S.	12 55 22							
F	S.	15.6							
Fl.	ePZ	G.W.				12 30 22	$\Delta_{PS-H} = 109^{\circ}1$		
	ePR ₁ Z	G.W.				12 35 44	$\Delta_{meas} = 109^{\circ}1$		
	iPR ₁ Z	G.W.			12 35 52				
	eSKSE	G.W.			12 42 01				
	iSKKSE	G.W.			12 43 02				
	eSN	G.W.			12 43 42				
	ePSE	G.W.			12 45 12				
	eZ	G.W.			12 48 17				
	eLE	G.W.			13 06.8				
	F	G.W.			15.3				
	<hr/>								
208	July 24	S.L.			ePZ	M.S.	22 15 38	Epicenter according to Pasadena: 34°01'N., 116°30'W. H = 22 ^h 10 ^m 40 ^s . $\Delta_{P-H} = 21^{\circ}7$ $\Delta_{meas} = 21^{\circ}7$	
					iPZ	M.S.	22 15 39		
			eSE	S.	22 19 48				
			iSE	S.	22 19 51				
			iLN	S.	22 22 08				
			F	S.	Lost				
		Fl.	ePZ	G.W.	22 15 37	$\Delta_{P-H} = 21^{\circ}6$			
			iPZ	G.W.	22 15 39	$\Delta_{meas} = 21^{\circ}6$			
			eSZ	G.W.	22 19 46				
			iSZ	G.W.	22 19 48				
			iLN	G.W.	22 21 57				
			F	G.W.	Lost				
			<hr/>						
			209	July 24	S.L.	iPZ	M.S.		22 59 19
eLN	S.	23 06 14							
F	S.	23.3							
Fl.	ePE	W.A.			22 59 17				

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks	
210	July 25	S.L.	ePZ	M.S.	00 51 27	Aftershock of # 208.	
			eLN	S.	00 58 15		
F	S.	01.2					
Fl.	ePE	W.A.	00 51 26				
211	July 25	S.L.	ePZ	M.S.	06 24 42		Aftershock of # 208.
			iSE	S.	06 28 53		
			eLE	S.	06 31 37		
			F	S.	07.1		
		Fl.	ePE	W.A.	06 24 41		
			eLE	W.A.	06 30 53		
F	W.A.	06.7					
212	July 25	S.L.	iPZ	M.S.	19 18 52	Epicentral Region: 26°1 S., 62°7 W. H = 19 ^h 08 ^m 46 ^s . h = 580±km. $\Delta_{P-H} = 69^{\circ}3$ $\Delta_{meas} = 69^{\circ}8$	
			ipPZ	M.S.	19 20 49		
			iSE	S.	19 27 04		
			iSPE	S.	19 27 56		
			esSE	S.	19 30 33		
			eSR ₁ E	S.	19 31 50		
			F	S.	20.0		
			Fl.	iPZ	G.W.		19 18 53
		epPZ		G.W.	19 20 52		$\Delta_{meas} = 70^{\circ}0$
		iSE		G.W.	19 27 06		
		iSPE		G.W.	19 27 57		
		esSE		G.W.	19 30 35		
		iSR ₁ E		G.W.	19 31 51		
		F	G.W.	20.0			
213	July 26	S.L.	iPZ	M.S.	02 54 35	Aftershock of # 208.	
			eSE	S.	02 58 45		
			eLN	S.	03 00 55		
			F	S.	Lost		
		Fl.	ePZ	G.W.	02 54 32		
			iPZ	G.W.	02 54 34		
			iSE	G.W.	02 58 43		
			eLE	G.W.	02 59.0		
214	July 26	S.L.	ePZ	M.S.	12 07 23	Epicentral Region: 46°1 N., 152°6 E. H = 11 ^h 55 ^m 23 ^s . $\Delta_{P-H} = 78^{\circ}8$ $\Delta_{meas} = 78^{\circ}8$	
			iPZ	M.S.	12 07 25		
			iSE	S.	12 17 15		
			F	S.	13.3		
		Fl.	ePZ	G.W.	12 07 21		$\Delta_{P-H} = 78^{\circ}4$
			iSE	G.W.	12 17 10		$\Delta_{meas} = 78^{\circ}6$
			eLE	G.W.	12.5		
			F	G.W.	13.1		

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
215	July 26	S.L.	ePR ₁ Z	M.S.	16 18 23	Region: 3°8 S., 139°3 E. H = 15 ^h 57 ^m 49 ^s . $\Delta_{PR_1-H} = 123^{\circ}4$ $\Delta_{meas} = 123^{\circ}6$
			iZ	M.S.	16 18 34	
eLE	S.	16.8				
F	S.	18.6				
Fl.	eZ	G.W.	16 18 33			
	eLE	G.W.	16.9			
	F	G.W.	17.5			
216	July 26	S.L.	eN	S.	23 16 17	
			ePR ₁ Z	M.S.	23 17 52	
ePSN	S.	23 27 22				
F	S.	01.5				
Fl.	ePE	G.W.	23 13 27			
	ePR ₁ E	G.W.	23 17 38			
	F	G.W.	23 24.3			
217	July 28	S.L.	iPZ	M.S.	03 56 45	Epicentral Region: 63°2 N., 145°7 W. H = 03 ^h 49 ^m 03 ^s . $\Delta_{P-H} = 40^{\circ}8$ $\Delta_{meas} = 40^{\circ}7$
			ePR ₂ Z	M.S.	03 58 35	
eSE	S.	04 03 06				
eSR ₁ E	S.	04 06 10				
iLE	S.	04 11 17				
F	S.	04.3				
Fl.	iPZ	G.W.	03 56 44			
	eSE	G.W.	04 03 01			
	iLE	G.W.	04 11 10			
	F	G.W.	04.9			
218	July 29	S.L.	iPZ	M.S.	02 48 29	South America. Possibly deep.
			eSE	S.	02 57 06	
Fl.	ePZ	G.W.	02 48 30			
	iPZ	G.W.	02 48 31			
	eSE	G.W.	02 57 06			
219	July 29	S.L.	ePZ	M.S.	12 56 43	
			eN	S.	13 08 03	
eLN	S.	13.2				
F	S.	Lost				
Fl.	eZ	G.W.	13 04 06			
	eZ	G.W.	13 08 13			
220	July 29	S.L.	iZ	M.S.	14 06 45	28°2 N., 93°2 E. H = 13 ^h 43 ^m 24 ^s . $\Delta_{PPS-H} = 113^{\circ}9$ $\Delta_{meas} = 113^{\circ}8$
			i(SKKS)N	S.	14 10 16	
			iPPSN	S.	14 13 30	
			i(SR ₁)N	S.	14 18 16	
			F	S.	19.5	

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No.	Date	Sta.	Phase	Inst.	h m s	Remarks
220 (Con'd.)	July 29	Fl.	e(P)Z	G.W.	13 58 04	$\Delta_{\text{meas}} = 113^{\circ}6$
			iN	G.W.	14 02 04	
			iN	G.W.	14 07 57	
			i(SKKS)N	G.W.	14 09 43	
			F	G.W.	20.7	
221	July 29	S.L.	eP'Z	M.S.	23 49 22	Moluccas.
			eLE	S.	24 35 45	
			F	S.	02.0	
222	July 30	S.L.	e(P)Z	M.S.	04 16 10	Very weak.
			eZ	M.S.	04 21 14	
223	July 31	S.L.	iPZ	M.S.	08 06 11	Epicenter according to B.C.I.S.: $39^{\circ}5'N$, $15^{\circ}E$. $H = 07^h54^m48^s$. $h = 250 - 380$ km. $\Delta_{\text{meas}} = 76^{\circ}7$
			eLN	S.	08 30 36	
			F	S.	08.6	
224	July 31	S.L.	iPZ	M.S.	14 20 24	Epicentral Region: $2^{\circ}3'N$, $83^{\circ}7'W$. $H = 14^h31^m20^s$. $h = 100^{\pm}$ km. $\Delta_{P-H} = 37^{\circ}1$ $\Delta_{\text{meas}} = 37^{\circ}0$
			iZ	M.S.	14 20 37	
			ipPZ	M.S.	14 20 48	
			iSE	S.	14 26 09	
			esSE	S.	14 26 56	
			iSR ₁ E	S.	14 28 38	
			eSR ₂ N	S.	14 28 59	
			F	S.	16.0	
			Fl.	e(F)Z	G.W.	
		eSE		G.W.	14 26 12	
		eSR ₁ E		G.W.	14 28 44	
		F		G.W.	15.5	

MINOR SEISMIC ACTIVITY

Date	Station	G.M.T. From	G.M.T. To	Remarks
July 6	S.L.	10 ^h 19 ^m	10 ^h 56 ^m	
July 7	Fl.	23 47	24 05	Time doubtful.
July 16	S.L.	04 52	07 30	
	Fl.	04 52	07 08	
July 20	S.L.	10 48	Lost in following quake at 12:42.	
	Fl.	10 48		
July 20	Fl.	11 31	12 11	
July 24	Fl.	11 07	Lost in following quake at 12:32.5.	
July 24	Fl.	23 04	23 17	
July 27	S.L.	19 00	20 12	
July 29	S.L.	06 44	08 37	
	Fl.	06 46	08 34	
July 30	S.L.	08 22	09 07	
July 31	S.L.	10 43	11 19	

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