

ANNUAL CATALOG OF EASTERN WASHINGTON SEISMICITY

July 1, 2005 through June 30, 2006

Dept. of Earth and Space Sciences
University of Washington
Seattle, Washington

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INTRODUCTION

The University of Washington Dept. of Earth and Space Sciences (formerly the Geophysics Program) has operated the Pacific Northwest Seismograph Network (PNSN; formerly known as the Washington Regional Seismograph Network or WRSN) since 1970. The eastern Washington portion of this network was supported by the U.S. Department of Energy (DOE) between 1975 and 1988 as both a research and operational contract. In 1988 the support to the University of Washington changed from a direct DOE contract to an operational contract only; currently administered through Battelle Pacific Northwest National Labs. No research is directly supported under this contract.

This report consists of a catalog and map for the period July 1, 2005 through June 30, 2006. These same events have been reported previously in quarterly technical reports, available on-line. However, there may be slight changes from these preliminary reports due to errors being found or additional data becoming available. A complete catalog of all earthquakes recorded and located by the University of Washington is available on-line along with other information about earthquake hazards and tectonics in the region at URL: <http://www.pnsn.org>

NOTABLE SEISMICITY

This report includes events in an area from 44 to 49 degrees north latitude, and from 117 to 121.5 degrees west longitude. Within this area, the largest felt event in eastern Washington this reporting period was a magnitude 2.9 earthquake on May 21, 2006(UTC) located about 17 km north of Goat Rocks at a depth of about 6 km. Only one event was reported felt, a magnitude 2.4 earthquake on Dec. 15, 2005 (UTC) located about 27 km west-northwest of Spokane at about less than 1 km depth.

PNSN Quarterly Reports provide more detailed information on eastern Washington earthquakes that have occurred in a smaller area covering the Hanford Reservation; between 45.5 - 49.5 degrees north latitude and 117 - 121 degrees west longitude. Excerpts from the quarterly reports follow.

From July 1 - Sept. 30, 2005, 41 earthquakes were located in eastern Washington in the area between 45.5 - 49.5 degrees north latitude and 117 - 121 degrees west longitude. The largest earthquakes recorded in eastern Washington this quarter were two magnitude 2.6 events. The first occurred on July 22 (UTC), and was located about 18 km north-northwest of Ellensburg at less than 1 km depth. The second was on Sept. 27 (UTC), and was located about 39 km east of Skykomish, WA at a depth of about 6 km.

From Oct. 1 – Dec. 31, 2005, 88 earthquakes were located in eastern Washington (45.5-49.5N; 117-121W). The largest earthquake recorded in eastern Washington this quarter was a magnitude 2.5 event on November 10 (UTC), located about 14 km west-southwest of Prosser at about 11km depth. This quarter's seismicity included a swarm of about 20 small (none larger than magnitude 2.0) shallow earthquakes (none deeper than 2 km) located near Wahluke, about 28 km west-southwest of Othello, during the month of December.

From Jan 1 – March 31, 2006, 79 earthquakes were located in eastern Washington (45.5-49.5N; 117-121W). The largest earthquake recorded in eastern Washington this quarter was a magnitude 2.7 event on January 19 (UTC), located about 24 km west-northwest of Yakima at about 8 km depth.

From April 1 – June 30, 2006, 59 earthquakes were located in eastern Washington(45.5-49.5N; 117-121W). The largest earthquake recorded in eastern Washington this quarter was a magnitude 2.8 event on April 8 (UTC), located about 8 km east-northeast of Entiat at less than 1 km depth.

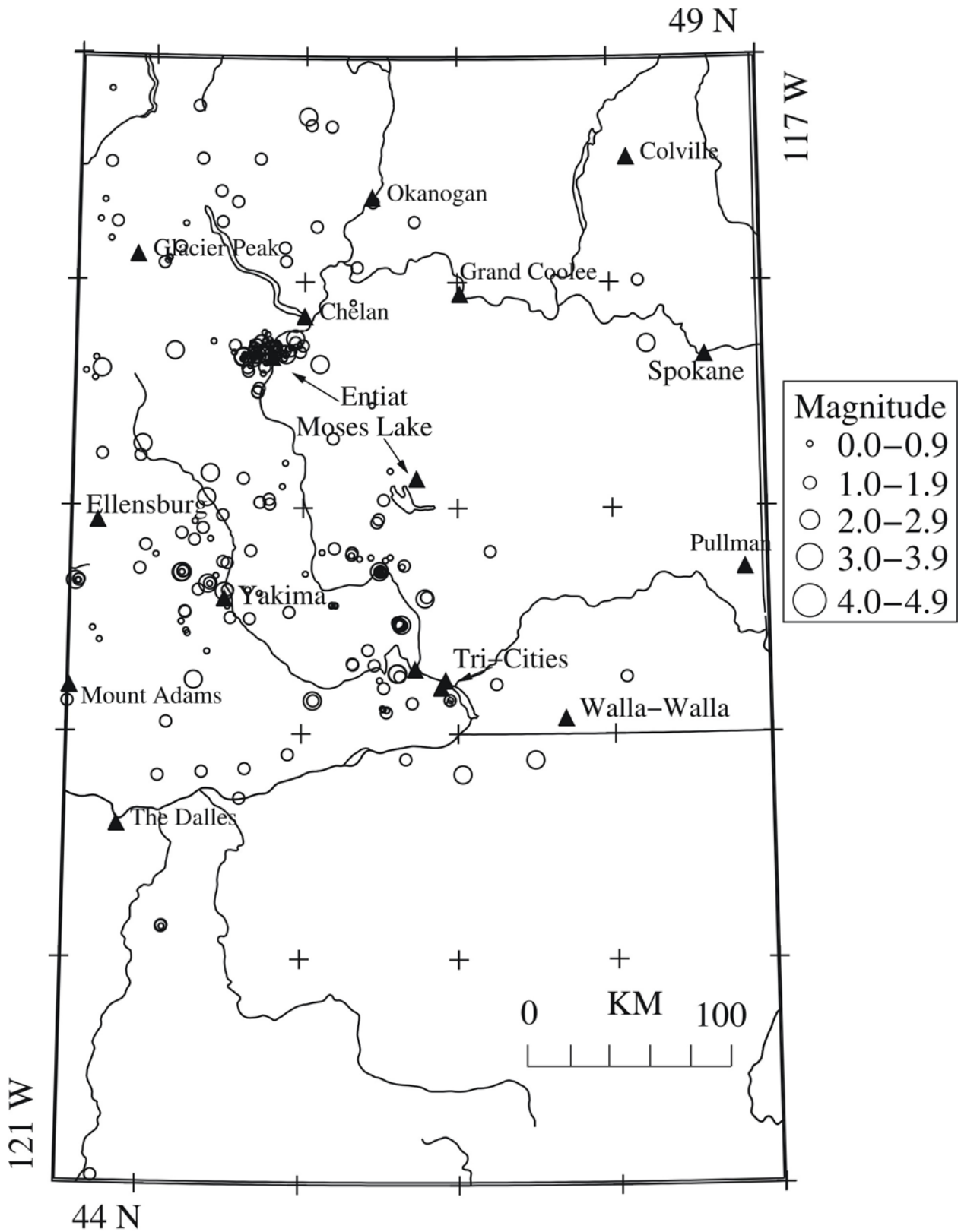


Figure 1. Earthquakes and blasts located in eastern Washington with magnitudes greater than or equal to 0.0 July 1 2005 - June 30, 2006. Triangles indicate cities or geographic landmarks.

KEY TO EARTHQUAKE CATALOG

Origin time is calculated for each earthquake on the basis of multi-station arrival times. Time is given in Coordinated Universal Time (UTC), in hours:minutes:seconds. To convert to Pacific Standard Time (PST) subtract eight hours, or to Pacific daylight time subtract seven hours.

North latitude of the epicenter, in degrees and minutes.

West longitude of the epicenter, in degrees and minutes.

The depth, given in kilometers, is usually freely calculated from the arrival-time data. In some instances, the depth must be fixed arbitrarily to obtain a convergent solution. Such depths are noted by an asterisk (*) in the column immediately following the depth. A \$ or a # following the depth mean that the maximum number of iterations has been exceeded without meeting convergence tests and both the location and depth have been fixed.

Coda-length magnitude M_c An estimate of local Richter magnitude (Richter, C.F., 1958, Elementary Seismology: W.H. Freeman and Co., 768p), calculated using the coda-length/magnitude relationship determined for Washington (Crosson, R.S., 1972, Bull. Seism. Soc. Am., v. 62, p. 1133-1171). Where blank, data were insufficient for a reliable magnitude determination. Normally, the only earthquakes with undetermined magnitudes are very small ones. Magnitudes may be revised as we improve our analysis procedure.

NS is the number of station observations, and

NP the number of P and S phases used to calculate the earthquake location. A minimum of three stations and four phases are required. Generally, more observations improve the quality of the solution.

Azimuthal gap. (GAP) the largest angle (relative to the epicenter) containing no stations.

The root-mean-square residual (RMS) (observed arrival time minus predicted arrival time) at all stations used to locate the earthquake. It is only useful as a measure of the quality of the solution when 5 or more well distributed stations are used in the solution. Good solutions are normally characterized by RMS values less than about 0.3 sec.

Two **Quality factors** indicate the general reliability of the solution (A is best quality, D is worst). Similar quality factors are used by the USGS for events located with the computer program HYPO71.

The first quality factor letter is a measure of the hypocenter quality based on travel time residuals. For example: Quality **A** requires an **RMS** less than 0.15 sec while an **RMS** of 0.5 sec or more is **D** quality (estimates of the uncertainty in hypocenter location also affect this quality parameter).

The second letter of the quality code depends on the spatial distribution of stations around the epicenter i.e. number of stations, their azimuthal distribution, and the minimum distance (**DMIN**) from the epicenter to a station. Quality **A** requires a solution with 8 or more phases, **GAP** less than or equal to 90 degrees, and **DMIN** less than or equal to 5 km or depth, whichever is greater. If the number of phases, **NP**, is 5 or less or **GAP** greater than 180 degrees or **DMIN** greater than 50 km the solution is assigned quality **D**.

The crustal velocity model used in location calculations.

C3	- Cascade model
N3	- northeastern model
E3	- southeastern model
O0	- Oregon model
R0	- Regional model

Events flagged in Catalog use the following code:

F	- earthquakes reported to have been felt
P	- probable explosion
L	- low frequency earthquakes
H	- handpicked from helicorder records
X	- known explosion

Event Catalog July 1, 2005 - June 30, 2006**44.0 -49.0 degrees N Latitude, 117.0-121.5 degrees W Longitude**

Jul-05											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
1	09:45:19.55	46 39.80	120 35.79	11.44\$	1.3	15/016	87	0.45	CB	E3	
1	15:36:48.87	46 51.38	120 41.93	18.41	1.2	4/005	148	0.03	AD	E3	
1	15:54:12.24	46 18.28	117 50.54	0.02*	1.9	12/012	244	0.17	BD	E3	P
1	19:15:45.51	46 16.57	117 58.36	2.93\$	2.0	10/010	232	0.23	CD	E3	P
3	08:33:35.27	47 43.59	120 11.34	0.57	-0.6	3/004	178	0.02	AD	N3	
5	17:03:49.04	46 18.63	119 40.69	0.44	1.1	5/005	181	0.08	AD	E3	
6	21:27:00.01	46 15.63	119 23.31	0.05*	2.3	17/017	212	0.28	BD	E3	P
8	01:41:34.54	46 47.37	120 56.74	8.3	0.4	4/004	241	0.00	AD	C3	
11	21:44:09.22	46 38.86	120 30.87	1.42	2.2	20/020	77	0.47	CC	E3	P
13	01:31:38.91	46 35.99	119 12.75	19.98	2.4	34/037	73	0.21	BA	E3	
13	02:34:34.07	46 36.35	119 12.10	18.06	1.7	21/021	75	0.16	BA	E3	
13	19:50:00.58	46 39.74	120 36.51	8.25*	2.1	25/025	88	0.17	BB	E3	
13	23:37:53.09	44 20.86	121 01.30	0.02*	2.6	9/009	176	0.10	AC	O0	P
16	00:21:33.52	48 31.43	121 17.48	1.56\$	1.9	13/014	101	0.44	CC	C3	
17	06:09:38.27	47 39.71	120 23.93	0.5	0.2	5/005	175	0.09	AD	N3	
17	08:38:26.72	47 40.62	120 23.50	0.65	0.8	5/005	160	0.09	AD	N3	
17	17:27:26.36	47 46.02	120 17.37	4.59	-0.6	4/004	112	0.00	AD	N3	
18	19:27:20.77	46 16.01	119 23.47	0.02*	2.5	25/025	209	0.26	BD	E3	X
22	03:53:52.04	47 09.12	120 36.22	0.02*	2.6	22/022	71	0.28	BA	N3	
26	05:12:13.80	46 14.17	120 41.41	1.36	2.5	20/020	170	0.24	BC	C3	
28	10:42:24.33	46 34.04	119 48.72	0.29	0.4	6/006	209	0.13	BD	E3	
29	13:44:30.04	47 40.77	120 05.26	5.13	-0.4	3/004	167	0.00	AD	N3	
Aug-05											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
3	19:38:11.53	48 21.24	120 26.84	2.13*	1.6	8/009	236	1.10	DD	C3	
4	06:25:56.21	46 18.20	119 32.23	17.97	1.3	24/027	112	0.12	AB	E3	
5	01:56:50.74	47 42.17	120 09.60	5.55	-0.3	3/004	168	0.00	AD	N3	
11	19:58:11.27	46 08.45	119 20.38	0.04*	2.2	20/020	117	0.26	BC	E3	P
15	20:46:50.88	46 32.07	120 45.09	1.27	1.0	5/005	196	0.20	BD	C3	
16	07:15:17.69	46 49.87	121 00.74	7.31	1.2	18/018	90	0.22	BC	C3	
16	09:10:19.96	46 39.67	120 35.78	6.44	0.8	6/007	185	0.13	AD	E3	
17	08:11:42.01	46 53.09	120 46.90	7.95	1.0	12/012	82	0.34	CC	C3	
20	08:33:00.12	46 33.76	120 28.86	6.62*	0.5	4/004	219	0.00	AD	E3	
22	19:10:17.88	45 53.09	118 30.61	1.74\$	2.4	13/013	207	0.31	DD	E3	
24	01:47:00.90	47 42.40	120 19.62	0.58	1.0	3/004	183	0.01	AD	N3	
25	13:57:31.16	47 40.45	120 23.23	7.71	-0.4	3/004	159	0.00	AD	N3	
26	17:00:30.65	48 00.40	117 48.69	0.61	1.2	5/005	163	0.48	DD	N3	
27	10:13:07.50	47 43.07	120 12.96	0.55	1.6	11/013	72	0.31	CC	N3	
27	18:56:41.79	45 08.71	120 51.95	18.5	1.5	7/008	84	0.08	AB	O0	
28	22:48:32.00	45 08.38	120 51.82	18.08	0.9	5/005	146	0.02	AD	O0	
29	12:37:57.52	48 03.89	119 39.48	0.32	1.1	6/006	209	0.59	DD	N3	

Sep-05											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
2	07:26:09.19	47 40.17	120 11.84	0.67	1.8	18/020	57	0.33	CC	N3	
2	21:31:35.04	47 43.76	120 20.40	0.61	0.4	3/004	251	0.36	DD	N3	
2	23:19:28.95	44 11.54	120 43.60	6.9	2.3	7/007	181	0.30	BD	O0	P
6	12:08:15.70	45 08.51	120 52.07	18.95	1.3	6/007	84	0.04	AC	O0	
6	13:31:05.66	46 26.75	119 36.88	16.33	-0.2	6/006	136	0.05	AC	E3	
6	18:07:13.22	45 08.74	120 51.95	18.51	1.3	7/008	83	0.05	AB	O0	
7	14:48:17.26	47 13.58	121 03.41	10.26\$	1.6	21/022	73	0.44	CB	C3	
14	18:34:20.37	46 15.27	119 22.40	0.03*	1.9	14/014	240	0.31	CD	E3	
14	22:18:51.65	47 42.33	120 15.04	0.61	1.6	8/011	77	0.33	CC	N3	
17	09:14:54.43	48 15.66	121 14.53	3.74\$	1.1	10/011	147	0.64	DC	C3	
17	09:16:55.04	48 16.14	121 21.24	10.80*	0.6	4/005	231	0.04	AD	C3	
21	09:57:14.35	47 42.51	120 05.09	1.37*	0.1	3/004	237	0.01	AD	N3	
22	20:16:19.28	47 41.22	120 27.57	4.45	0.4	4/005	193	0.08	BD	N3	
23	19:30:34.66	44 21.42	121 01.02	0.02*	2.1	4/004	186	0.04	AD	O0	P
25	17:15:50.42	46 43.56	121 02.82	0.86	1.2	14/015	94	0.15	BC	C3	
26	06:08:54.16	46 34.12	119 47.61	0.35#	0.9	13/013	204	0.14	AD	E3	
26	17:52:50.65	47 41.59	120 07.71	0.67	1.2	4/005	150	0.09	AD	N3	
27	18:37:23.74	47 45.47	119 24.06	0.56#	1.7	4/004	341	0.58	DD	N3	P
27	22:46:17.21	47 41.55	120 50.92	5.76	2.6	25/025	50	0.29	BC	C3	
28	09:53:13.39	47 35.79	121 25.49	97.07	0.7	9/011	69	0.16	BA	C3	
Oct-05											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
2	19:33:34.86	46 28.91	119 22.08	0.42	1.4	12/012	107	0.05	AB	E3	
4	04:31:12.78	47 35.64	120 16.15	11	0.2	3/004	219	0.00	AD	N3	
6	03:26:39.96	46 28.72	119 22.37	2.87	1.1	7/007	157	0.04	AC	E3	P
6	12:35:35.76	47 41.33	120 20.03	0.67	1.1	4/005	120	0.05	AD	N3	
9	14:05:21.06	47 39.07	120 19.79	3.56	1.8	17/018	96	0.12	AB	N3	
10	03:13:06.61	47 38.52	120 14.98	0.37	0.7	4/004	132	0.20	BD	N3	
10	08:03:23.67	47 41.67	120 08.22	6.44	-0.2	3/004	154	0.00	AD	N3	
10	13:50:15.84	47 37.12	120 22.24	0.39	1.0	4/004	184	0.08	BD	N3	
13	02:48:37.74	47 41.29	120 13.58	4.04	-0.5	3/004	186	0.00	AD	N3	
13	03:20:00.82	46 27.20	120 44.70	11.4	0.6	5/007	155	0.16	CD	C3	
15	04:47:27.57	46 42.61	119 29.83	1.31	0.6	5/007	91	0.10	BD	E3	
16	10:42:02.99	47 42.64	120 11.78	0.56	1.2	8/011	123	0.15	BC	N3	
16	15:29:40.25	46 34.18	119 48.57	0.02*	0.2	8/013	208	0.13	AD	E3	
17	17:22:09.41	47 13.88	121 18.40	11.31\$	1.8	36/041	49	0.45	CC	C3	
20	05:10:04.37	46 02.88	120 51.69	0.02*	1.2	5/006	309	0.18	BD	C3	
20	18:14:02.29	46 18.11	118 31.77	0.44#	1.1	7/008	190	0.13	AD	E3	P
20	21:33:31.69	46 11.52	119 13.74	0.03*	2.2	18/018	145	0.14	AC	E3	P
20	21:49:44.79	44 36.55	121 10.15	3.98	1.7	6/006	102	0.09	BC	O0	P
21	04:02:33.11	48 46.60	120 42.82	10.07	1.2	10/012	216	0.33	CD	C3	
21	09:14:39.13	47 40.59	120 20.01	7.46	0.6	5/007	122	0.14	BD	N3	
24	20:34:46.66	45 53.48	120 22.05	3.43\$	1.6	5/005	186	0.50	DD	E3	P
26	21:51:43.89	47 39.99	120 23.75	0.51	0.4	4/004	170	0.08	AD	N3	
28	22:17:06.37	46 38.02	120 28.81	0.02*	1.8	7/007	149	0.39	CC	E3	
31	04:09:23.78	48 50.85	121 17.94	6.72\$	0.9	5/005	300	0.42	DD	C3	
31	09:28:17.09	47 41.12	120 08.24	6.22	0.5	5/007	154	0.05	AD	N3	

Nov-05											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
1	10:37:15.28	47 44.59	120 05.05	6.51	-0.3	4/005	113	0.00	AD	N3	
4	17:27:20.17	47 40.67	120 09.93	5.48	0.9	4/005	155	0.03	AD	N3	
6	05:35:48.23	48 05.47	120 07.57	0.76	1.1	4/005	227	0.08	BD	N3	
7	11:29:23.75	47 40.49	120 13.15	1.62	0.6	4/007	144	0.11	CD	N3	
8	02:52:05.80	46 51.64	120 35.69	15.19	0.2	7/007	120	0.21	BB	E3	
8	17:29:03.51	48 32.60	120 18.05	0.03*	1.4	3/005	310	0.19	BD	C3	
8	23:03:37.89	47 09.84	119 26.28	0.79	0.4	4/004	203	0.05	AD	N3	
10	12:45:59.36	46 08.77	119 55.85	10.53*	2.5	22/022	114	0.10	AB	E3	
10	13:05:47.62	46 08.78	119 55.61	10.35	1.1	11/011	154	0.04	AC	E3	
11	02:30:49.58	46 38.67	119 24.91	16.21	-0.3	6/007	150	0.04	AC	E3	
11	18:53:59.07	46 27.79	119 03.26	0.02*	1.4	6/006	102	0.32	CC	E3	P
15	20:29:49.85	45 54.51	121 02.65	2.5	1.5	14/014	90	0.23	BC	C3	P
15	22:40:05.15	47 27.36	119 33.45	0.56	0.4	4/006	171	0.38	CD	N3	
20	13:34:22.93	47 41.52	120 14.29	0.6	0.0	4/006	128	0.06	AD	N3	
21	09:51:18.16	47 39.90	120 19.42	3.05	0.6	5/005	118	0.14	CD	N3	
21	19:58:25.32	46 14.37	119 42.58	0.05*	1.8	10/011	171	0.20	BC	E3	P
22	23:20:24.51	47 02.23	120 13.28	0.29	1.8	8/008	107	0.29	BC	N3	
23	05:46:58.65	47 40.62	120 23.51	2.76	-0.5	3/004	160	0.00	AD	N3	
23	06:59:09.04	47 42.01	120 06.90	7.27	-0.1	4/007	145	0.07	AD	N3	
23	18:53:39.35	46 15.78	119 23.15	0.45	1.8	10/010	211	0.19	BD	E3	P
24	06:15:33.06	48 04.93	120 55.56	8.13	1.7	10/012	138	0.20	BC	C3	
25	15:57:14.32	47 39.90	120 24.12	0.64	2.4	22/022	54	0.17	BB	N3	
26	11:34:50.59	47 39.16	120 23.42	4.34	0.8	4/005	222	0.02	AD	N3	
28	02:31:47.72	47 40.49	120 07.27	0.72	0.7	3/004	221	0.03	AD	N3	
29	09:04:39.85	48 06.22	120 53.69	4.32	0.7	6/008	180	0.26	BC	C3	
Dec-05											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
1	20:34:22.85	46 57.42	120 23.37	1.74	2.3	11/011	77	0.32	CC	E3	P
3	05:01:53.22	46 43.32	119 30.07	0.4	0.7	7/007	130	0.17	BB	E3	
3	14:53:13.34	46 43.10	119 30.15	0.05*	0.4	6/007	112	0.12	AC	E3	
3	14:55:44.98	46 43.62	119 29.96	3.52	0.6	6/006	96	0.07	AC	E3	
3	23:51:21.01	46 42.95	119 30.30	0.17	0.0	5/005	83	0.12	AD	E3	
4	04:10:16.21	46 43.27	119 30.27	3.61	0.7	8/008	89	0.11	AB	E3	
4	04:32:08.93	47 43.91	120 03.58	0.03*	1.1	4/005	190	0.06	AD	N3	
4	04:48:43.40	46 43.14	119 30.63	6.25	0.3	4/005	148	0.02	AD	E3	
4	04:55:45.66	46 43.11	119 30.16	0.48	1.5	16/016	66	0.07	AB	E3	
4	04:59:35.24	46 43.20	119 29.96	2.73	0.9	7/007	89	0.08	AB	E3	
4	05:01:02.70	46 43.21	119 30.28	0.04*	2.0	20/020	67	0.12	AB	E3	
4	05:23:48.79	46 46.92	119 26.20	10.85*	0.4	4/004	284	0.14	AD	E3	
5	09:26:45.23	46 43.07	119 30.08	0.83*	0.0	5/005	130	0.04	AD	E3	
5	21:13:16.65	46 16.05	119 23.25	0.03*	2.3	15/015	209	0.21	BD	E3	
7	09:16:53.97	46 43.56	119 30.52	4.15	-0.1	5/006	93	0.08	AD	E3	
8	02:30:17.52	47 40.07	120 20.07	5.9	0.9	4/005	125	0.06	AD	N3	
8	02:55:48.55	46 15.18	117 55.33	0.02*	1.3	10/010	263	0.17	BD	E3	
8	23:06:19.05	47 30.60	120 18.11	3.73	2.0	6/006	172	0.04	AC	N3	P
9	11:15:30.05	46 43.29	119 30.03	1.5	0.7	7/007	90	0.09	BB	E3	
10	09:34:15.21	47 41.16	120 13.27	5.92	0.2	3/006	182	0.02	AD	N3	
10	14:51:34.64	46 43.06	119 30.05	0.02*	1.2	11/012	69	0.12	AB	E3	

Dec-05											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
10	15:26:49.86	46 43.08	119 29.70	1.94	1.0	6/006	87	0.07	BC	E3	
10	16:00:07.29	46 43.03	119 30.43	0.74	0.4	4/004	127	0.00	AD	E3	
11	11:05:28.86	47 43.30	120 18.86	0.53	1.2	7/009	98	0.10	AC	N3	
14	17:44:32.18	47 45.98	120 14.46	1.7	0.1	4/006	158	0.05	BD	N3	
15	10:26:02.42	47 43.56	117 45.73	0.05*	2.4	9/009	292	0.41	CD	N3	F
15	12:48:47.05	46 56.26	120 41.81	11.13	0.9	10/010	126	0.45	CB	E3	
15	13:05:12.09	48 43.90	119 59.25	0.03*	2.4	16/016	146	0.30	CD	N3	
15	15:19:29.00	46 42.84	119 29.82	0.47	0.9	8/008	83	0.09	AA	E3	
15	16:16:47.64	46 45.56	120 30.84	0.49	1.3	4/004	237	0.30	CD	E3	
16	02:20:45.02	45 49.21	118 58.30	14.27*	2.0	18/018	155	0.23	BC	E3	
17	00:57:13.45	48 06.03	120 53.93	1	-0.1	3/004	178	0.09	AD	C3	
17	08:13:37.48	46 42.91	119 29.90	0.07	0.6	6/006	90	0.03	AC	E3	
17	13:19:06.31	46 43.04	119 30.07	2.07	0.4	4/004	143	0.00	AD	E3	
17	13:20:47.85	46 43.07	119 30.15	3.68	-0.1	4/004	143	0.00	AD	E3	
18	03:54:26.03	46 43.40	119 30.92	6.82	0.4	4/004	122	0.00	AD	E3	
19	03:22:44.18	46 32.10	119 33.71	0.42	-0.8	3/004	294	0.35	DD	E3	
19	08:53:19.42	45 54.36	120 05.16	15.67	1.3	12/013	161	0.14	AD	E3	
19	20:04:14.36	47 36.54	121 19.37	4.81#	2.1	30/032	40	0.39	CC	C3	
19	22:11:39.15	47 39.35	121 21.69	13.76	0.4	4/006	240	0.04	AD	C3	
20	05:43:40.18	47 43.03	120 27.24	0.62	1.7	17/018	78	0.24	BB	N3	
20	08:57:45.31	45 50.57	120 21.53	21.94	1.6	6/006	207	0.22	CD	E3	
20	09:33:05.11	46 43.85	119 29.19	6.09	-0.1	3/004	238	0.00	AD	E3	
22	20:40:03.45	47 40.26	120 23.51	5.48	0.2	5/006	164	0.14	BD	N3	
22	21:30:50.95	47 30.56	120 18.17	0.02*	1.0	7/007	96	0.15	BC	N3	
23	12:41:52.85	46 26.40	119 35.89	16.8	-0.2	8/009	123	0.05	AB	E3	
24	06:31:49.40	48 21.32	121 19.60	8.53	0.2	6/007	190	0.05	AD	C3	
27	13:15:37.08	46 30.66	120 27.77	28.16*	1.5	4/004	228	0.00	AD	E3	
28	07:35:40.86	46 46.82	119 33.67	21.16	0.1	4/004	234	0.00	AD	E3	
28	10:59:57.67	46 43.36	119 30.29	0.41	0.9	10/010	69	0.13	AB	E3	
28	23:14:44.07	47 31.79	120 17.09	0.43	1.3	5/005	196	0.21	BD	N3	P
29	03:00:31.13	48 41.59	119 57.79	0.37#	1.7	7/008	146	0.61	DD	N3	
29	10:30:00.98	46 28.74	119 22.68	0.03*	1.4	9/009	101	0.04	AB	E3	
29	11:39:13.00	47 40.10	120 18.99	0.56	1.3	7/009	106	0.09	AB	N3	
31	10:12:19.78	48 06.05	120 53.73	1.27*	0.1	3/004	178	0.08	AD	C3	
Jan-06											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
1	00:25:43.12	47 39.36	120 24.12	0.63	-0.5	4/005	182	0.05	AD	N3	
1	01:46:13.75	46 28.88	119 21.84	0.26	1.1	8/008	109	0.08	AB	E3	
1	01:46:55.52	46 28.97	119 21.95	0.55	1.2	5/005	132	0.08	AD	E3	
3	17:29:58.68	47 39.57	120 20.14	5.99	0.2	4/004	133	0.00	AD	N3	
3	23:12:58.00	46 29.55	120 46.51	12.05	0.9	6/006	209	0.20	CD	C3	
5	07:29:32.13	47 37.37	120 15.59	4.8	1.6	15/017	57	0.14	AB	N3	
5	19:02:38.57	47 46.54	120 15.67	0.64	0.5	3/004	243	0.18	CD	N3	
6	00:29:44.54	47 31.68	120 17.67	3.49	1.0	6/006	177	0.04	AC	N3	
6	01:28:44.56	47 33.95	121 21.89	10.27	0.6	6/008	129	0.12	AC	C3	
6	09:53:15.10	46 43.13	119 30.43	0.46	0.1	7/007	86	0.12	AB	E3	
8	08:16:07.80	46 06.45	119 28.73	8.72*	0.4	7/008	297	0.03	AD	E3	
8	10:22:48.52	46 05.73	119 27.52	8.46*	1.1	10/012	198	0.08	AD	E3	

Jan-06											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
8	10:44:07.77	46 06.25	119 27.40	7.34	0.2	4/006	299	0.08	BD	E3	
8	14:56:34.23	46 06.74	119 28.97	7.87	0.5	5/006	295	0.01	AD	E3	
9	20:19:27.93	47 18.43	119 48.56	0.54	1.5	11/013	96	0.58	DC	N3	
10	16:32:58.69	48 21.29	119 33.30	0.93	1.8	9/010	152	0.24	BC	N3	
12	15:09:14.53	47 44.11	120 35.72	5.65	0.5	4/007	260	0.10	AD	C3	
13	18:42:13.84	47 11.87	120 07.06	0.88	0.7	4/004	290	0.07	BD	N3	
13	22:29:32.90	47 36.19	120 22.02	5.69	1.4	11/011	95	0.15	BB	N3	
16	08:31:14.11	48 06.02	120 53.80	0.96\$	-0.4	3/004	178	0.12	DD	C3	
16	11:07:43.29	46 26.52	120 44.14	3.66	0.3	4/004	209	0.00	AD	C3	
17	10:23:42.23	47 42.84	120 11.16	3.11	1.5	11/013	63	0.24	BC	N3	
18	17:53:60.00	47 43.11	120 01.95	4.16	0.4	3/004	244	0.00	AD	N3	
19	04:54:12.23	46 42.53	120 46.90	8.2	2.7	36/036	57	0.26	BA	C3	
19	05:42:39.68	46 43.00	120 46.00	8.56	1.3	8/008	128	0.08	AB	C3	
19	05:43:23.73	46 42.68	120 46.45	7.68*	2.4	16/016	130	0.25	BB	C3	
19	12:20:39.63	46 57.95	120 31.14	6.69	1.0	4/004	173	0.00	AD	E3	
20	20:38:41.73	46 56.14	119 31.39	0.03*	1.5	10/010	200	0.23	BD	E3	
22	17:39:08.34	47 41.29	120 10.72	0.65	1.2	9/010	112	0.32	CC	N3	
24	07:42:57.77	47 43.45	120 12.85	0.69	0.6	4/005	132	0.02	AD	N3	
25	03:21:43.38	47 44.91	120 03.58	4.54	2.0	17/019	84	0.25	BB	N3	
25	11:07:47.20	46 29.14	119 22.53	0.3	1.2	7/007	124	0.09	AB	E3	
25	23:30:11.95	45 51.42	119 17.04	0.88	1.3	5/005	225	0.17	BD	E3	P
26	15:17:54.92	48 05.43	120 54.34	1.03	0.1	3/004	222	0.08	BD	C3	
28	20:44:51.46	46 08.13	119 17.66	1.3	1.0	12/012	175	0.19	BC	E3	
29	16:51:14.15	46 42.65	120 46.51	9	0.7	5/006	143	0.09	AD	C3	
30	20:40:15.21	47 39.52	120 24.21	2.49	0.4	4/006	180	0.08	BD	N3	
30	23:18:29.18	47 30.49	120 18.20	2.02*	2.1	4/004	283	0.01	AD	N3	P
31	06:18:14.04	46 42.84	120 46.20	8.86*	1.1	9/009	130	0.12	AB	C3	
31	21:21:51.60	46 57.07	119 30.69	2.63	1.2	10/010	73	0.20	BA	E3	
Feb-06											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
3	16:48:49.18	46 51.12	119 24.60	5.06	-0.1	3/005	182	0.00	AD	E3	
6	16:56:46.22	47 02.15	119 28.79	0.02*	1.2	6/007	292	0.22	BD	N3	L
6	21:09:36.99	46 11.39	119 14.42	0.05*	1.6	13/014	150	0.27	BC	E3	P
6	21:59:36.56	47 30.78	120 18.27	0.61	1.3	8/008	124	0.28	BC	N3	
6	22:36:03.17	47 43.78	120 10.87	2.5	0.9	6/008	123	0.04	AC	N3	
7	06:00:30.37	46 48.53	120 20.12	2.9	1.0	11/011	106	0.31	CC	E3	
7	21:25:30.69	46 11.26	119 27.83	0.04*	2.0	14/014	252	0.22	BD	E3	P
10	00:42:48.17	45 32.96	120 13.22	1.63#	2.3	6/006	298	0.11	AD	E3	P
11	09:06:46.60	48 16.05	119 17.01	1.3	1.3	6/006	224	0.12	BD	N3	
13	14:30:48.05	46 47.57	119 41.13	0.02*	1.7	25/025	37	0.22	BB	E3	
16	09:44:16.10	46 48.15	119 40.97	5.7	1.5	11/011	126	0.25	BB	E3	
16	21:02:38.82	47 39.94	120 06.48	0.71	-0.5	3/005	175	0.02	AD	N3	
18	10:56:20.64	47 16.75	121 02.68	10.76\$	2.2	21/021	74	0.48	CB	C3	
18	22:13:08.24	47 01.39	120 16.78	0.86	1.4	5/005	101	0.08	AD	N3	
20	07:49:13.96	46 43.17	119 29.87	2.22	1.1	11/012	88	0.07	AB	E3	
21	19:52:35.57	46 12.14	119 28.56	2.61	1.6	11/011	312	0.27	DD	E3	
22	14:54:45.16	47 54.54	119 41.01	0.89*	0.9	5/005	166	0.07	AD	N3	
24	00:11:10.48	46 48.50	118 47.49	1.69	1.4	9/009	198	0.13	AD	E3	

Feb-06											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
24	20:56:09.32	47 00.99	120 13.02	9.62	1.1	5/005	137	0.06	BD	N3	
25	01:19:13.33	46 09.00	119 02.95	10.24	0.9	8/009	128	0.20	BB	E3	
25	01:59:10.28	46 08.22	119 03.39	12.73	0.9	8/008	145	0.14	BC	E3	
Mar-06											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
1	11:01:14.52	46 32.24	120 05.13	17	1.5	24/027	103	0.15	AB	E3	
2	01:38:59.69	46 14.20	119 30.17	2.91	0.5	4/004	300	0.00	AD	E3	
3	12:43:57.52	46 41.84	120 33.46	19.12	0.1	4/004	203	0.00	AD	E3	
4	04:36:59.57	46 29.50	119 23.11	0.28	1.2	6/006	138	0.06	AC	E3	
5	06:07:36.43	47 43.16	120 18.53	5.22	1.0	5/006	97	0.05	AD	N3	
6	17:05:37.26	45 49.73	120 37.85	23.08	1.4	6/008	304	0.35	DD	E3	
10	06:40:01.29	48 15.86	120 32.88	7.11	1.1	6/008	254	0.17	BD	C3	
10	17:51:37.52	47 41.93	120 16.30	5.51	1.3	15/019	78	0.12	AC	N3	
10	20:36:20.70	46 27.48	121 20.50	5.16	0.1	4/004	239	0.00	AD	C3	
10	21:48:00.66	46 08.99	119 03.20	1.08	1.7	10/010	172	0.12	AC	E3	X
12	05:53:20.42	47 41.23	120 20.31	5.34	0.1	4/006	182	0.07	AD	N3	
12	15:54:28.37	47 43.04	120 00.60	6.97	1.2	6/008	106	0.10	AC	N3	
13	06:32:41.09	47 40.13	120 16.26	3.07	0.4	4/006	130	0.03	AD	N3	
13	16:06:14.12	46 34.04	119 47.24	0.04*	0.5	5/006	208	0.09	AD	E3	
13	20:47:45.81	46 39.84	121 26.35	8.75	0.9	7/009	257	0.08	AD	C3	
13	21:35:11.29	46 08.12	119 04.69	0.64	1.8	4/004	168	0.13	BD	E3	P
13	22:16:40.90	46 43.27	119 30.27	3.3	0.7	5/006	142	0.14	BD	E3	
14	01:32:36.53	46 39.84	121 26.69	7.06	0.7	9/011	159	0.08	AC	C3	
14	07:33:00.63	46 28.91	119 22.05	0.37	1.4	6/006	130	0.08	AC	E3	
14	10:44:14.90	47 40.17	120 23.90	0.52	2.1	17/019	93	0.24	BB	N3	
14	19:57:58.74	46 05.98	119 05.19	8.71*	1.7	4/004	188	0.27	BD	E3	P
15	20:24:07.31	46 05.57	118 46.98	0.04*	2.4	9/009	135	0.31	CC	E3	P
17	20:01:48.04	46 32.25	120 45.21	1.09	1.0	4/004	196	0.33	CD	C3	
18	21:31:30.01	47 40.45	120 23.43	0.66	0.8	4/005	161	0.08	AD	N3	
19	14:32:28.37	47 44.27	120 17.29	5.42	1.5	8/010	92	0.05	AC	N3	
20	07:06:52.29	47 37.73	120 21.19	6.37	0.1	3/004	166	0.00	AD	N3	
24	14:09:25.14	47 43.91	120 14.38	0.71	1.2	7/009	106	0.14	AC	N3	
26	22:02:28.31	47 41.52	120 11.82	0.74	1.0	8/010	74	0.24	BC	N3	
27	14:45:16.35	46 42.42	119 58.92	9.6	0.5	8/008	117	0.04	AB	E3	
30	19:05:53.99	47 39.73	120 13.11	6.41	-0.6	3/005	166	0.02	AD	N3	
30	20:01:30.92	46 08.28	119 03.99	0.02*	2.0	7/007	141	0.14	AC	E3	P
31	01:47:33.71	45 48.70	120 54.54	15.14	1.0	11/013	154	0.20	BD	C3	
Apr-06											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
1	19:00:48.97	47 44.27	120 15.15	0.69	0.8	5/006	137	0.08	AD	N3	
1	22:12:50.89	47 40.97	120 12.91	5.07	0.2	3/004	178	0.00	AD	N3	
2	04:52:08.04	47 43.10	120 19.87	5.68	0.8	6/008	95	0.08	AC	N3	
2	12:14:29.82	46 13.14	118 45.31	13.09	1.4	5/005	298	0.04	BD	E3	
5	07:18:18.89	47 41.03	120 17.93	0.37	1.3	7/007	109	1.02	DB	N3	
6	17:34:43.70	47 40.48	120 14.43	0.55	2.0	14/014	73	0.24	BC	N3	
6	19:50:10.74	47 38.13	119 53.89	0.44	2.2	6/006	119	0.55	DC	N3	
7	03:25:13.25	47 42.81	120 03.26	5.73	0.4	5/007	125	0.06	AD	N3	
8	03:49:24.57	47 40.71	120 07.10	0.49	2.8	26/026	45	0.23	BC	N3	

Apr-06											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
9	20:05:32.39	47 39.58	120 14.57	0.66	1.2	5/006	149	0.05	AD	N3	
11	01:49:51.28	46 46.88	119 24.42	15.2	-0.3	6/006	147	0.08	AC	E3	
13	06:23:48.21	46 21.71	120 36.54	15.35	0.5	4/005	216	0.17	CD	E3	
14	12:27:48.18	46 47.40	119 41.13	4.02	0.7	6/006	276	0.05	BD	E3	
16	05:13:41.96	46 44.34	119 21.53	2.41	0.5	8/010	96	0.13	AB	E3	
16	09:10:58.00	47 41.14	120 12.96	6.08	-0.5	3/005	180	0.02	AD	N3	
16	12:53:26.60	46 48.15	119 52.53	22.05	0.4	13/013	166	0.19	BC	E3	
17	19:05:59.02	46 29.01	119 21.75	0.31	2.0	12/012	64	0.05	AB	E3	
18	07:23:00.34	46 44.69	119 20.80	0.02*	1.4	19/019	89	0.14	AB	E3	
18	21:45:30.12	46 07.42	119 05.11	0.03*	2.2	8/008	148	0.29	BC	E3	P
19	23:33:20.32	44 02.14	121 16.27	5.27	1.7	12/012	254	0.24	BD	O0	
20	00:19:09.70	47 41.74	120 05.53	6.16	1.3	7/010	132	0.07	AB	N3	
21	15:45:16.77	45 53.25	119 20.02	13.15	1.7	11/011	317	0.08	CD	E3	
22	05:43:51.79	48 32.60	120 41.08	1.74\$	1.4	6/007	251	0.61	DD	C3	
22	12:39:10.72	46 29.17	119 22.99	0.27	1.5	10/010	71	0.04	AB	E3	
23	09:18:56.49	46 08.03	121 29.53	6.83	1.2	8/008	181	0.08	AD	C3	
24	17:23:09.99	47 40.88	120 19.29	4.1	1.0	5/007	113	0.17	BD	N3	
25	04:34:19.88	48 09.06	120 08.05	0.84	1.3	7/009	244	0.02	AD	N3	
25	07:49:59.37	47 39.86	120 18.96	6.98	1.2	7/009	109	0.07	AB	N3	
25	22:24:51.50	46 08.80	119 02.93	0.02*	1.8	10/010	176	0.11	AC	E3	P
27	20:45:53.25	47 10.22	120 40.23	0.03*	1.8	8/008	105	0.25	BB	C3	P
28	04:45:23.17	48 41.32	119 49.76	34.83	1.6	5/005	287	0.05	BD	N3	
28	20:35:26.12	45 37.84	121 11.66	0.96	1.7	5/005	147	0.12	AD	C3	P
29	11:04:34.85	46 46.17	119 28.02	8.72	0.7	6/006	174	0.19	BC	E3	
30	14:02:32.67	47 49.17	120 04.15	5.76	-0.3	3/004	176	0.00	AD	N3	
May-06											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
1	05:07:25.14	48 23.99	120 33.49	4.12	1.5	7/010	238	0.31	CD	C3	
2	15:28:28.37	46 46.54	119 38.04	7.14	0.4	5/005	287	0.27	DD	E3	
3	12:20:21.97	48 09.45	121 21.34	11.91	-0.3	5/006	125	0.24	CD	C3	
3	18:39:13.89	47 41.35	120 01.64	6.76	1.0	4/006	159	0.06	AD	N3	
7	21:08:44.92	46 38.09	120 40.17	18.45	1.1	19/022	97	0.16	BB	E3	
7	23:30:56.69	47 40.78	120 19.42	0.65	1.5	12/013	91	0.27	BB	N3	
8	15:56:50.99	48 15.34	120 47.38	1.33\$	0.9	6/009	190	0.55	DD	C3	
10	18:06:34.59	47 40.00	120 17.80	0.54	0.2	4/005	150	0.07	AD	N3	
10	19:11:30.30	46 11.10	118 52.83	1.35*	1.5	4/004	244	0.00	AD	E3	P
11	19:57:04.79	45 53.26	119 18.70	0.9	2.3	9/009	129	0.16	BC	E3	P
14	19:32:13.11	47 39.06	120 24.42	0.51	-0.3	4/006	189	0.10	AD	N3	
14	22:21:57.59	47 39.61	120 07.93	6.09	0.9	5/006	175	0.03	AD	N3	
17	20:46:47.52	45 53.13	119 18.91	2.31	2.3	10/010	129	0.27	BC	E3	P
18	20:01:38.36	46 10.07	118 56.41	8.84*	1.7	4/004	249	0.11	AD	E3	P
19	21:40:08.59	46 37.19	120 16.56	0.44	0.7	4/004	126	0.06	AD	E3	
20	00:21:58.53	44 16.96	120 52.67	4.24\$	2.6	8/009	199	0.13	DD	O0	P
20	22:35:31.15	46 45.24	120 29.19	19.5	1.8	35/044	77	0.26	BA	E3	
21	18:39:39.68	46 39.97	121 27.53	5.75	2.9	55/056	66	0.17	BB	C3	
22	02:18:45.65	46 39.94	121 26.56	8.57	0.8	6/008	158	0.07	AC	C3	
22	02:33:03.44	46 49.25	119 47.81	1.77	1.2	16/016	142	0.14	AC	E3	
26	01:58:22.15	46 28.85	119 22.53	0.5	1.2	6/006	122	0.16	BC	E3	

May-06											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
26	11:18:31.80	48 09.16	120 49.36	9.01	1.1	9/010	161	0.10	AC	C3	
29	09:09:47.64	47 07.74	120 23.32	12.15	1.2	8/009	116	0.17	BB	N3	
30	04:20:20.51	46 54.54	120 38.71	6.40\$	1.6	8/010	82	0.28	CA	E3	
30	16:56:47.07	47 02.67	120 37.50	21.15*	2.0	7/007	155	0.24	BC	N3	
30	20:58:17.16	46 18.37	119 40.51	2.9	1.7	10/010	164	0.05	AC	E3	
Jun-06											
DAY	TIME	LAT	LON	DEPTH	M	NS/NP	GAP	RMS	Q	MOD	TYP
1	18:57:44.07	46 30.44	120 20.25	9.99	1.4	10/010	135	0.23	BB	E3	
1	20:01:43.64	46 07.96	119 04.73	0.03*	2.0	11/011	153	0.36	CC	E3	P
3	02:50:29.67	47 42.27	120 06.18	6.77	0.5	4/005	143	0.02	AD	N3	
3	05:23:39.60	48 11.07	121 16.90	11.33	0.5	6/008	134	0.24	BC	C3	
3	18:16:41.46	46 29.63	119 23.26	3.99	1.5	12/014	102	0.09	AB	E3	
4	10:11:58.70	46 29.07	119 22.70	0.41	1.4	8/008	122	0.08	AB	E3	
5	21:07:28.31	46 07.29	119 06.34	0.03*	1.8	8/008	181	0.17	BD	E3	P
5	21:38:06.16	46 24.35	121 17.83	9.04\$	0.6	8/008	193	0.08	BD	C3	
6	09:15:47.28	46 40.17	121 26.13	0.05*	1.2	12/014	130	0.14	AB	C3	
7	22:14:03.34	46 37.65	120 30.16	0.02*	2.1	22/022	43	0.25	BC	E3	
11	17:36:42.35	48 14.69	119 55.43	0.79	1.6	7/007	258	0.22	BD	N3	
14	08:07:54.09	46 29.32	119 22.50	0.29	1.3	9/009	106	0.15	AB	E3	
14	15:50:55.70	47 05.69	120 08.15	0.04*	0.9	4/005	220	0.32	CD	N3	
15	14:16:20.01	47 37.84	120 14.57	0.61	-0.1	3/005	179	0.10	BD	N3	
18	17:57:47.36	46 22.25	119 34.67	18.7	1.1	21/027	120	0.15	BB	E3	
19	23:44:56.57	46 09.35	118 58.80	2.6	1.5	5/005	225	0.11	CD	E3	P
21	03:08:19.15	45 42.66	120 23.41	10.74\$	1.6	14/016	78	0.20	BC	E3	
21	22:15:22.53	46 38.09	120 21.06	9.66	0.6	4/004	183	0.00	AD	E3	
24	03:18:01.60	47 41.77	120 17.23	1.46	-0.5	3/004	217	0.00	AD	N3	
30	16:34:01.61	46 40.04	121 26.36	5.54	1.6	18/022	71	0.20	BB	C3	
30	18:28:18.17	46 08.51	119 02.87	0.03*	1.6	7/007	166	0.28	BC	E3	P