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Earthquake Activity Around Valdez, Alaska For 1983-1984

by

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INTRODUCTION

In July and September 1983, two moderate (6.4 and 6.3 M_S*) earthquakes centered near Columbia Bay shook south central Alaska and caused minor damage in Valdez. In response to these shocks, the U.S. Geological Survey (USGS) reactivated three seismograph stations in the Valdez region (they had been turned off due to lack of funding in 1982) to intensify earthquake monitoring within approximately a 100-km radius of Valdez. This report summarizes the seismicity for 1983 and 1984; it includes tables of hypocenters and magnitudes, maps and depth sections of the located earthquakes, and a brief description of some of the major features observed in the seismicity.

SEISMOTECTONIC FRAMEWORK

The Valdez region lies on an active convergent plate margin where Alaska, as part of the North American plate, is being underthrust by the Pacific plate which is moving relatively northwestward at a rate of approximately 6 cm/yr (Minister and others, 1974) (Figure 1). The Aleutian trench, which marks the near-surface Pacific-North America plate boundary south of the Aleutian arc and the Alaskan Peninsula, can be traced eastward to about longitude 144°W where the topographic expression of the trench dies out approximately south of Kayak Island. Between this termination and the strike-slip Fairweather fault along the coast in southeast Alaska, the plate boundary undergoes a complex transition from subduction to transform motion.

The extent and configuration of the Pacific plate underlying Alaska can be inferred, in part, from the distribution of subcrustal earthquakes that occur within the underthrust plate near its upper surface (termed Benioff or Wadati zone events). A pronounced, northwest-dipping zone of seismicity, (e.g. Fogleman and others, 1983; Stephens and others, 1985) called the Aleutian Benioff zone, indicates that the subducted Pacific plate dips smoothly to the northwest with an average dip of about 8° from the Aleutian trench to about the 50-km contour, where its dip increases to about 40° between 50 and 100 km depth (Lahr and Stephens, 1983). The seismicity continues down to depths of 200 km west of Cook Inlet and 150 km north of the Denali fault (Lahr, 1975). The Aleutian volcanic arc approximately follows the surface projection of the 100-km contour of the Aleutian Benioff zone northeastward along the Aleutian arc to a point west of northern Cook Inlet. The easternmost extent of the Aleutian Benioff zone appears to be bounded by a line that extends northwest from the eastern terminus of the Aleutian trench (Stephens and others, 1984a).

South of the Wrangell volcanoes is the weakly active north-northeast-dipping Wrangell Benioff zone. Based upon the limited seismicity observed to date, this zone is currently defined to 103 km depth and extends beneath the volcanoes (Stephens and others, 1984a, and unpublished data). An aseismic wedge separates the western edge of the Wrangell Benioff zone from the Aleutian zone. At the present time the relationship between these two zones is poorly understood (Stephens and others, 1984a).

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* Surface-wave (M_S) and body-wave (m_b) magnitudes listed in this report were obtained from the Preliminary Determination of Epicenters (PDE) of the U.S. Geological Survey National Earthquake Information Center (NEIC), formerly the National Earthquake Information Service.

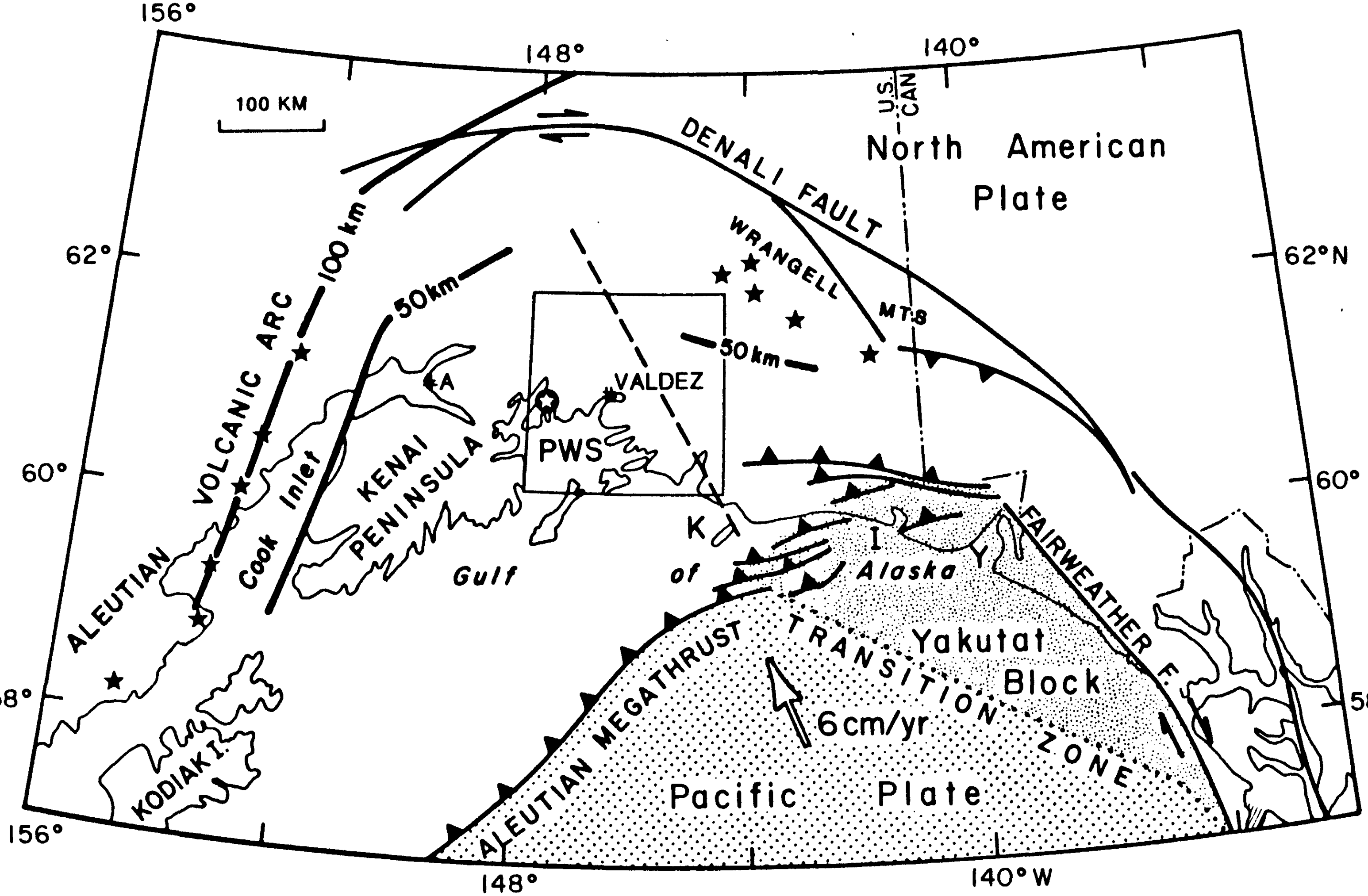

Figure 1. Map of seismotectonic framework of southern Alaska and the Gulf of Alaska (modified from Stephens and others, 1984a). Arrow, Pacific plate motion vector relative to north American plate from RM1 pole of Minster and others (1974). Heavy lines, surface projections of 50- and 100-km contours of upper surface of Benioff zone from Lahr (1975) and Stephens and others (1984a). Intermediate lines, principal faults with known or suspected Cenozoic motion after Plafker (1969), Beikman (1980), and Bruns (1979); thrust faults have barbs on upthrown side. Dashed line, approximate northeastern extent of the Aleutian Benioff zone. Solid stars, Quaternary volcanoes. Open star, epicenter of 1964 Alaska earthquake. PWS = Prince William Sound; A = Anchorage; K = Kayak Island; I = Icy Bay; Y = Yakutat Bay. Box indicates Valdez study area.

Evidence for continued convergent motion between the Pacific and North America plates comes from studies of recent large earthquakes along sections of the plate boundary adjacent to the Gulf of Alaska. For example, the 1964 Alaska earthquake (8.4 M_S) (9.2 M_W; Kanamori, 1977), which had an epicenter located roughly 80 km (Figure 1) west of Valdez, resulted from low-angle, predominantly dip-slip motion of about 12 m (Hastie and Savage, 1980) on the section of the Aleutian megathrust (the interface zone between the Pacific and North American plates) extending from beneath Prince William Sound south to Kodiak Island and east to Kayak Island (Plafker, 1969; Sykes, 1971).

The 1979 St. Elias earthquake (7.1 M_S) ruptured the plate boundary from Yakutat Bay to Icy Bay (Stephens and others, 1980). The plate boundary between Icy Bay and Kayak Island has been identified as a seismic gap, termed the Yakataga seismic gap (McCann and others, 1980), and has an inferred western limit located about 75 km east of Valdez (Stephens and others, 1985). The Yakataga seismic gap is considered to have a high conditional probability (55-percent for normal distribution) of rupturing in a great ($M_W \geq 7.8$) megathrust earthquake within the next two decades (Jacob, 1984).

INSTRUMENTATION

The Office of Earthquakes, Volcanoes, and Engineering (formerly the Office of Earthquake Studies) of the USGS began a program of telemetered seismic recording in southern coastal Alaska in 1971 with an initial network of 10 permanent stations, 7 around Cook Inlet and 3 in the Chugach Mountains east and north of Prince William Sound, including one in Valdez. By the end of 1973, the network consisted of 26 stations extending from western Cook Inlet to eastern Prince William Sound. A year later, installation of 20 additional stations expanded the network eastward along the coastal region to Yakutat. As of January 1983, nine high-gain seismograph stations were operating in the Valdez area, one of which is maintained by the University of Alaska, Fairbanks (Figure 2). Three stations (GLC, VZW, and FID) which had been turned off in 1982, due to lack of funding, were reactivated in 1983 after the occurence of the July 12, 1983, Columbia Bay earthquake. During the summer of 1984, two USGS stations (CSG and RAG), and a station operated in cooperation with the University of Washington (TTV) were installed; and the station GLC was moved to a nearby location and its station code changed to GLI. The coordinates and other pertinent information for stations operating within the Valdez study area are tabulated in Table 1.

Each station has a single, vertical-component seismometer. The station VLZ also has two horizontal-component seismometers. Data from each seismometer are telemetered via a combination of VHF radio links and leased telephone circuits, some of which use satellite links having a 0.27 s transmission delay per hop, to the Alaska Tsunami Warning Center operated by the National Oceanic and Atmospheric Administration (NOAA) in Palmer, Alaska. At Palmer the data are recorded in analog format on 16-mm film and magnetic tape and mailed weekly to Menlo Park, California for data analysis. A more detailed discussion of the instrumentation and a complete listing of all USGS seismograph stations in southern Alaska can be found in published catalogs (for example, Fogleman and others, 1983 and Fogleman and others, 1986).

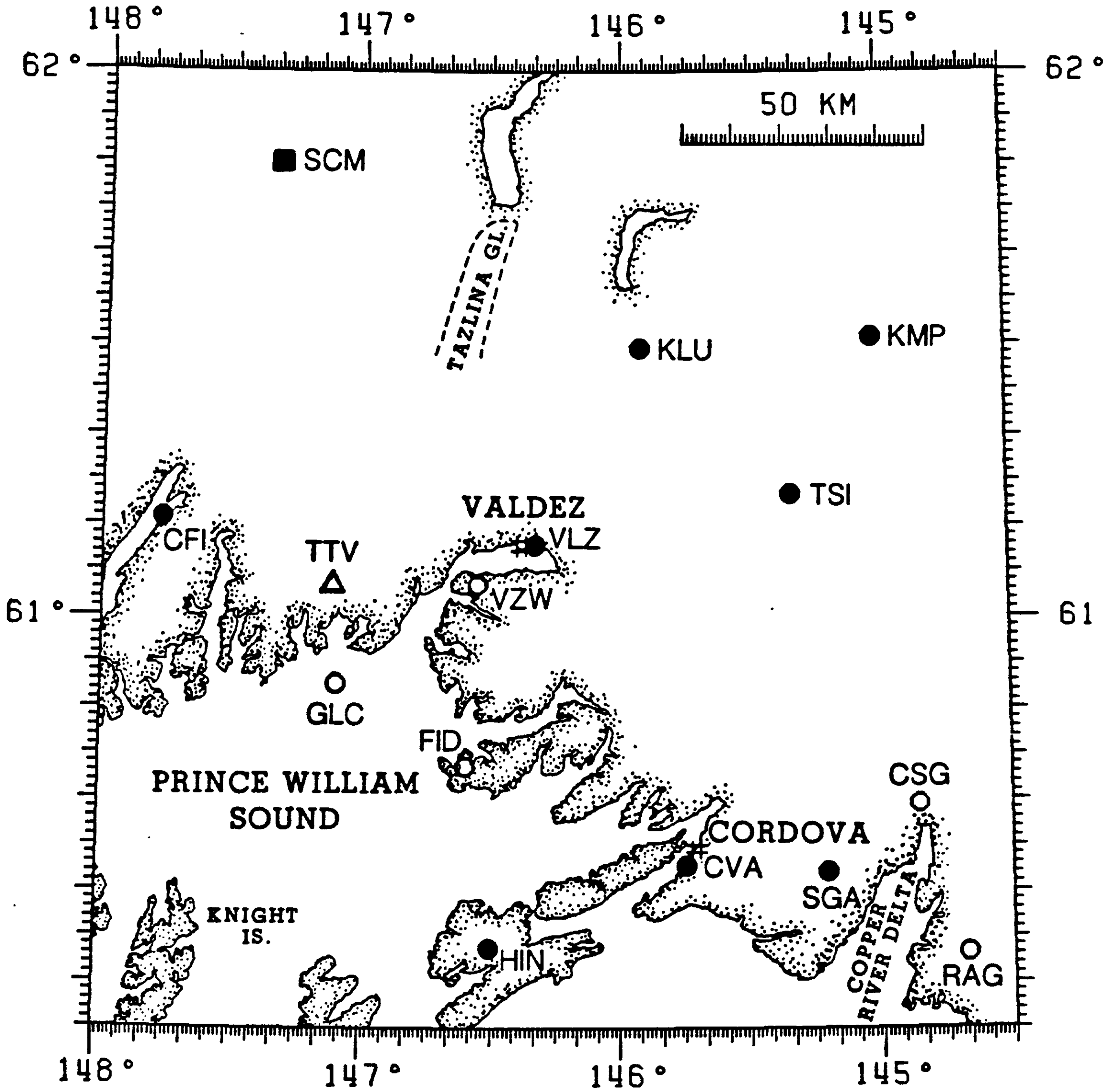

Figure 2. Map of seismograph stations in the Valdez region operated by the USGS (circles), University of Alaska (square), University of Washington (triangle). Solid symbols, stations operating as of January 1983; open symbols, stations activated after June 1983.

STA CODE	STATION NAME	LATITUDE N	LONGITUDE W	ELEV M	D KM	DLY SEC	TDLY SEC	MAG AT 1 HZ	INST	OPENED MN/DY/YR	CLOSED MN/DY/YR
CFI	COLLEGE FIORD	61 10.96	147 45.99	3	0.01	0.00	0.00	45600	USGS		--OPEN--
CSG	CHILDS GLACIER	60 39.66	144 51.30	678	0.01	0.00	-0.81	82000	USGS	7/20/84	--OPEN--
CVA	CORDOVA	60 32.79	145 44.96	90	0.01	0.00	-0.81	20900	USGS		--OPEN--
FID	FIDALGO	60 43.73	146 35.79	488	0.01	0.00	-0.27	80500	USGS	7/16/83	--OPEN--
GLC	GLACIER ISLAND	60 53.44	147 4.38	3	0.01	0.00	-0.27	94200	USGS	7/16/83	9/17/84
GLI	GLACIER ISLAND	60 52.78	147 5.65	429	0.01	0.00	-0.27	94200	USGS	9/18/84	--OPEN--
HIN	HINCHINBROOK ISLAND	60 23.81	146 30.10	611	0.01	0.00	-0.81	42500	USGS		--OPEN--
KLU	KLUTINA	61 29.57	145 55.21	1021	0.01	0.00	0.00	316100	USGS		--OPEN--
KMP	KIMBALL PASS	61 30.78	145 1.09	1143	0.01	0.00	-0.27	173200	USGS		--OPEN--
RAG	RAG	60 23.22	144 40.51	739	0.01	0.00	-0.81	47100	USGS	7/15/84	--OPEN--
SCM	SHEEP MOUNTAIN	61 50.00	147 19.66	1020	0.01	0.00	0.00		UOFA		--OPEN--
SGA	SHERMAN GLACIER	60 32.04	145 12.42	424	0.01	0.00	-0.81	74400	USGS		--OPEN--
TSI	TSINA	61 13.57	145 20.24	1113	0.01	0.00	-0.27	76000	USGS		--OPEN--
TTV	TERENTIEV LAKE	61 3.29	147 7.29	533	0.01	0.00	-0.27		UOFW	9/19/84	--OPEN--
VLZ	VALDEZ	61 7.89	146 19.92	10	0.01	0.10	-0.27	45600	USGS		--OPEN--
VZW	VALDEZ WEST	61 3.54	146 33.24	796	0.01	0.00	-0.27	86600	USGS	7/16/83	--OPEN--

Table 1. Geographic coordinates and other pertinent information for seismograph stations operated by the USGS and other institutions operating within the Valdez study area. DLY is the station P-phase treveltime delay correction in seconds. TDLY is the telephone line delay correction in seconds. The magnification (MAG) of the vertical seismograph component is given at 1 Hz. The institutions (INST) other than the USGS operating the stations are the Geophysical Institute of the University of Alaska (UOFA) and the University of Washington (UOFW). OPENED and CLOSED gives the month, day, and year a station was activated or turned off during the time period 1983 through 1984. Stations operating throughout this time period are listed only as "--OPEN--". Stations FID, GLC, and VZW were recorded temporarily on portable magnetic tape recorders for the periods July 16-20 and September 12-14, 1983 and were not recorded in Palmer until September 30, 1983.

DATA PROCESSING

Data are processed in Menlo Park using the following multi-step routine:

1) Scanning: One of the 16-mm Develocorder film records is scanned to identify and note approximate times and magnitudes of seismic events detected by the network.
2) Timing: For the local earthquakes identified in the scanning process, the following data are read for each station: P- and S-phase arrival times; direction of first motion of the P wave; duration of signal with amplitudes in excess of 1 centimeter (coda duration) on a film viewer with 20X magnification; and period and amplitude of maximum recorded signal. Due to the large number of earthquakes recorded by the network only those shocks that are of greatest interest to current research objectives are located. For the time period covered by this report all shocks west of longitude 145°W with coda durations greater than or equal to 30 seconds were timed. East of 145°W, all earthquakes which were recorded by at least three stations and for which at least four clear arrivals could be read were timed. Beginning in April 1984, all shocks with a P-to-S-phase time interval of less than or equal to 2 seconds at the station VLZ were also timed.
3) Initial computer processing: The data read from the films and tapes are batch processed by computer using the program HYPOELLIPSE (Lahr, 1984) to obtain origin times, hypocenters, magnitudes, and, if desired, first-motion plots for fault-plane solutions. The HYPOELLIPSE computer program determines hypocenters by minimizing differences between observed and computed traveltimes through an iterative least-squares scheme. In many respects the program is similar to HYPO71 (Lee and Lahr, 1972), which has been used in the preparation of catalogs of central California since January 1969. An important feature available in HYPOELLIPSE is the calculation of confidence ellipsoids for each hypocenter. The ellipsoids provide valuable insite into the effect of network geometry on possible hypocentral errors.
4) Analysis of initial computer results: Each hypocentral solution is checked for large traveltime residuals and for a poor spatial distribution of stations. Arrival times that produce large residuals are re-read. For shocks with a poor azimuthal distribution of stations, readings from additional stations are sought.
5) Final computer processing: The data for shocks with poor hypocentral solutions are rerun with corrections, and the new solutions are checked for large traveltime residuals that might be due to remaining errors.

VELOCITY MODEL

The following empirically-derived velocity model (Page and others, 1974) is used to locate earthquakes recorded by the stations in the Valdez study area (Figure 2):

Layer	Depth (km)	P velocity (km/s)
1	0.0	2.75
2	0.01	6.4
3	below 39	8.0

A small P-phase traveltime corrections (DLY, Table 1) is applied to the stations VLZ. S-phase corrections are determined by multiplying the P-correction by 1.78, the ratio of P-to-S-phase velocities. Additional corrections (TDLY, Table 1) are applied to compensate for the delay in the relay of the signal through one or more satellite links. The velocity models and stations corrections used for stations operating outside the Valdez study area can be found in Fogleman and others (1986).

MAGNITUDE

Magnitudes are determined from either the coda duration or the maximum trace amplitude. Eaton and others (1970) approximated the local Richter magnitude, whose definition is tied to maximum trace amplitudes recorded on standard Wood-Anderson horizontal torsion seismographs, by a magnitude based on maximum trace amplitudes recorded on high-gain, high-frequency vertical seismographs, such as those operated in the Alaskan network. The amplitude magnitude, XMAG, used in this catalog is based on the work of Eaton and his co-workers and is given by the expression (Lee and Lahr, 1972):

$$XMAG = \log_{10} A - B_1 + B_2 \log_{10} D^2 \qquad (1)$$

where A is the equivalent maximum trace amplitude in millimeters on a standard Wood-Anderson seismograph, D is the hypocentral distance in kilometers, and B_1 and B_2 are constants. Differences in the frequency response of the two seismograph systems are accounted for in A. It is assumed, however, that there is no systematic difference between the maximum horizontal ground motion and the maximum vertical motion. The terms $-B_1 + B_2 \log_{10} D^2$ approximate Richter's $-\log_{10}A_0$ function (Richter, 1958, p. 342), where A_0 is the trace amplitude of a magnitude zero earthquake as a function of epicentral distance as observed for earthquakes in southern California. The constants used are $B_1 = 0.15$ and $B_2 = 0.08$ for D = 1-200 km, and $B_1 = 3.38$ and $B_2 = 1.50$ for D = 200-600 km. The constants in the attenuation function have not been calibrated for southern coastal Alaska.

Coda duration magnitudes are also used because the maximum trace amplitude is often off scale due to the limited dynamic range of the film recording. For small, shallow shocks in central California, Lee and others (1972) express the coda duration magnitude, M_D, at a given station by the relationship:

$$M_D = -0.87 + 2.00 \log_{10} T + 0.0035 D \qquad (2)$$

where T is the signal duration in seconds from the P-wave onset to the point on the Develocorder film where the peak-to-peak trace amplitude of the coda envelope measured on a film viewer with 20X magnification falls below 1 cm, and D is the epicentral distance in kilometers. For this report magnitudes reported as coda duration magnitudes will be labeled M_D.

Comparison of XMAG and M_D estimates from equations (1) and (2) for 77 Alaskan shocks in the depth range 0 to 150 km and in the magnitude range 1.5 to 3.5 reveals a systematic linear decrease of M^D relative to XMAG with increasing focal depth. However, no systematic dependence of T on D has been found. The following equation, including a linear depth-dependence term but not a distance term, is therefore used for Alaska:

$$M_D = -1.15 + 2.00 \log_{10} T + 0.007 Z \qquad (3)$$

where Z is the focal depth in kilometers.

The coda duration magnitudes calculated from the network data are systematically less than the magnitudes reported in the Earthquake Data File (EDF) of NOAA (Lahr and Stephens, 1983). Based on a preliminary analysis (John Lahr, unpublished data), the empirical relationship between body-wave magnitude m_b and coda duration magnitude M_D, is:

$$m_b = 1.4 M_D - 0.39 \qquad (4)$$

The magnitude preferentially assigned to each earthquake in this catalog is the mean of the M_D (equation 3) estimates obtained for USGS stations. Where no M_D can be determined, the mean of the XMAG (equation 1) estimates for USGS stations is reported.

ANALYSIS OF HYPOCENTRAL QUALITY

Two types of errors enter into the determination of hypocenters: systematic errors limiting the accuracy and random errors limiting the precision. Systematic errors result mainly from incorrect modeling of the seismic velocity structure in the earth and from incorrect phase identification. Random errors arise from timing errors and their effect on the solution can be estimated for each earthquake through the use of standard statistical techniques.
The HYPOELLIPSE computer program determines hypocenters by minimizing differences between observed and computed traveltimes through an iterative least-squares process. For each earthquake, HYPOELLIPSE calculates the lengths and orientations of the principal axes of the joint confidence ellipsoid. The one-standard-deviation confidence ellipsoid describes the region of space within which one is 68 percent confident that the hypocenter lies, assuming that the only source of error is random reading errors. The confidence ellipsoid is a function of the geometry of the stations recording each individual event, the velocity model assumed, and the standard deviation of the random reading error; it is a measure of the precision of the hypocentral solution (see descriptions of SEH and SEZ in Appendix A). Repeated readings of the same phases by four seismologists have determined that the standard deviation is as small as 0.01 to 0.02 s for the most impulsive arrivals and as large as 0.10 to 0.20 s for emergent arrivals. The confidence ellipsoids are computed for a standard deviation of 0.16 s and therefore likely overestimate the 68 percent confidence regions. The standard deviation of the residuals for an individual solution is not used to calculate the confidence ellipsoid because it contains information not only about random reading errors but also about the incompatibility of the velocity model to the data. In a few extreme cases the value calculated for one of the ellipsoid axes becomes very large corresponding to a spatial direction with very great uncertainty. In these cases an upperbound length of 25 km is tabulated. In most hypocentral solutions, the epicentral precision (SEH) is better determined than the focal depth precision (SEZ) such that SEH is generally smaller than SEZ.

To fully evaluate the quality of a hypocenter one must consider both the size and orientation of the confidence ellipsoid and the root-mean-square (RMS) residual (see description of RMS in Appendix A). In addition to reflecting random errors, the RMS residual can be large due to the misfit of the velocity model to actual velocities within the earth, misinterpretation of phases, and systematic timing errors. In areas where the velocity structure is accurately known, a large RMS residual probably would indicate errors in the phase data. If the assumed velocity model does not represent the true seismic velocity structure within the earth, RMS residuals could be large and reflect the incompatibility; alternatively, the RMS residuals could be small and not indicate the actual error in a mislocated hypocenter.

Other parameters provided by HYPOELLIPSE that are helpful in evaluating the quality of a hypocentral solution are: 1) GAP, the largest azimuthal separation in degrees between stations, as measured from the epicenter. If GAP exceeds 180o, the earthquake lies outside the network of stations used to locate the shock, and the solution is generally less reliable than for events occuring inside the network. 2) D1, the epicentral distance in kilometers of the closest station used in the solution. Solutions where the calculated depth is greater than D1 generally have smaller SEZ values (better depth precision) than for events that have calculated depths less than the epicentral distance to the closest station. 3) NP and NS, the number of P- and S-arrivals, respectively, used in the solution. The accuracy of the solutions generally improves with an increase in the number of P- and S-arrivals. The RMS residual may actually increase, however, if distant stations are included in locating an event, because the differences between the observed and calculated traveltimes commonly increase with increasing epicentral distance due to the errors in the assumed velocity model. Such systematic errors may cause the RMS residual to increase, even though the addition of distant stations well-distrubuted in azimuth generally improves the accuracy of the solution.

FOCAL DEPTHS

Previous studies (e.g., Francis and others, 1978; Lilwall and Francis, 1978; Uhrhammer, 1980; and McLaren and Frohlich, 1985) have shown that the accuracy of focal depths for shocks occurring in the vicinity of a local seismic network is primarily a function of the geometrical configuration of the network, the number of P- and S-phase arrivals read, and of the adequacy of the assumed velocity model. Depths are generally more accurate for earthquakes where the distance from the epicenter to the closest station (D1) is less than the calculated focal depth and for events located within the network or on its periphery. The accuracy of focal depths usually increases as the number of S-phase arrivals increases.

Focal depths in the Valdez study area generally are not well constrained, especially for shallow crustal events due to the uneven station distribution and large station spacing relative to the observed seismicity, and to a lack of knowledge about the velocity structure. Calculated depths for the same event can vary by several kilometers depending on the number of P-and S-phase arrivals used in the location, the trial focal depth, the velocity model, and the P-phase traveltime corrections used to locate the earthquake.

REVIEW OF DATA

The spatial distribution of the 480 earthquakes located in the Valdez area for 1983 (Figures 3 and 4; Appendix A) is grossly similar to that observed for the 219 events located in 1984 (Figures 6 and 7; Appendix C). Principal features of the 1983-1984 seismicity include: 1) the 1983 Columbia Bay earthquakes located 50 km west of Valdez and their decaying aftershock sequences; 2) the 55-km-long southwest-northeast-trending concentration of activity centered 30 km northwest of Valdez in the vicinity of the Tazlina Glacier; 3) the Copper River delta concentration of events 100 km southeast of Valdez; 4) a cluster of earthquakes beneath Knight Island about 110 km southwest of Valdez; 5) scattered activity beneath Prince William Sound and in the northwest corner of the study area; and 6) a lack of seismicity in the northeast corner of the study area.

The large decrease in the number of events located in the Valdez region from 1983 to 1984 can be attributed to the decay in the rate of aftershocks of the 1983 Columbia Bay events. If all of the events within a rectangular box (latitude 60.9° - 61.1°N, longitude 147° - 147.5°W) around the Columbia Bay aftershock zone are removed from the data, the number of remaining events located in the study area, 178 versus 186 earthquakes, is almost equal for the two successive years.

Columbia Bay

The dominant feature in the distribution of hypocenters is the large number of aftershocks from the July 12 and September 7, 1983, Columbia Bay earthquakes on the north edge of Prince William Sound. The July and September shocks with surface-wave magnitudes of 6.4 and 6.2, respectively, are the largest to have occurred in the Prince William Sound region since the magnitude 9.2 (moment magnitude) earthquake of 1964. The July event occurred about 45 km west of Valdez at a depth of 30 km. The September event was located about 10 km southwest of the July shock, also at a depth of 30 km. The two epicenters lie approximately 25 km east of the epicenter of the 1964 earthquake. The July earthquake produced the strongest ground acceleration (0.32 *g* at Valdez) recorded for an Alaskan earthquake since strong-motion recording began in Alaska following the 1964 shock (Maley and Ellis, 1984).

Within 4 or 5 days of each mainshock, portable three-component seismographs were temporarily deployed in and around the epicentral region to obtain accurate aftershock locations (Page and others, 1985). The sites of the July temporary stations were reoccupied in September.

A special set of traveltime corrections was developed using well-located aftershocks recorded by both the temporary local and permanent regional seismographs. These corrections were used to relocate the aftershocks for the intervals July 16-24 (30 events) and September 12-14 (25 events). Origin times, focal coordinates, and magnitudes for these relocated events are listed in Appendix B.

The July aftershock hypocenters (Figure 5, triangles) defined a 27-km long rupture plane, striking northeasterly and dipping 65° to the northwest. The shocks ranged in depth from 22-32 km. Aftershock activity extended the initial 20-km long rupture several kilometers northeastward between the second and the twelfth days. The September mainshock occurred at the southwest end

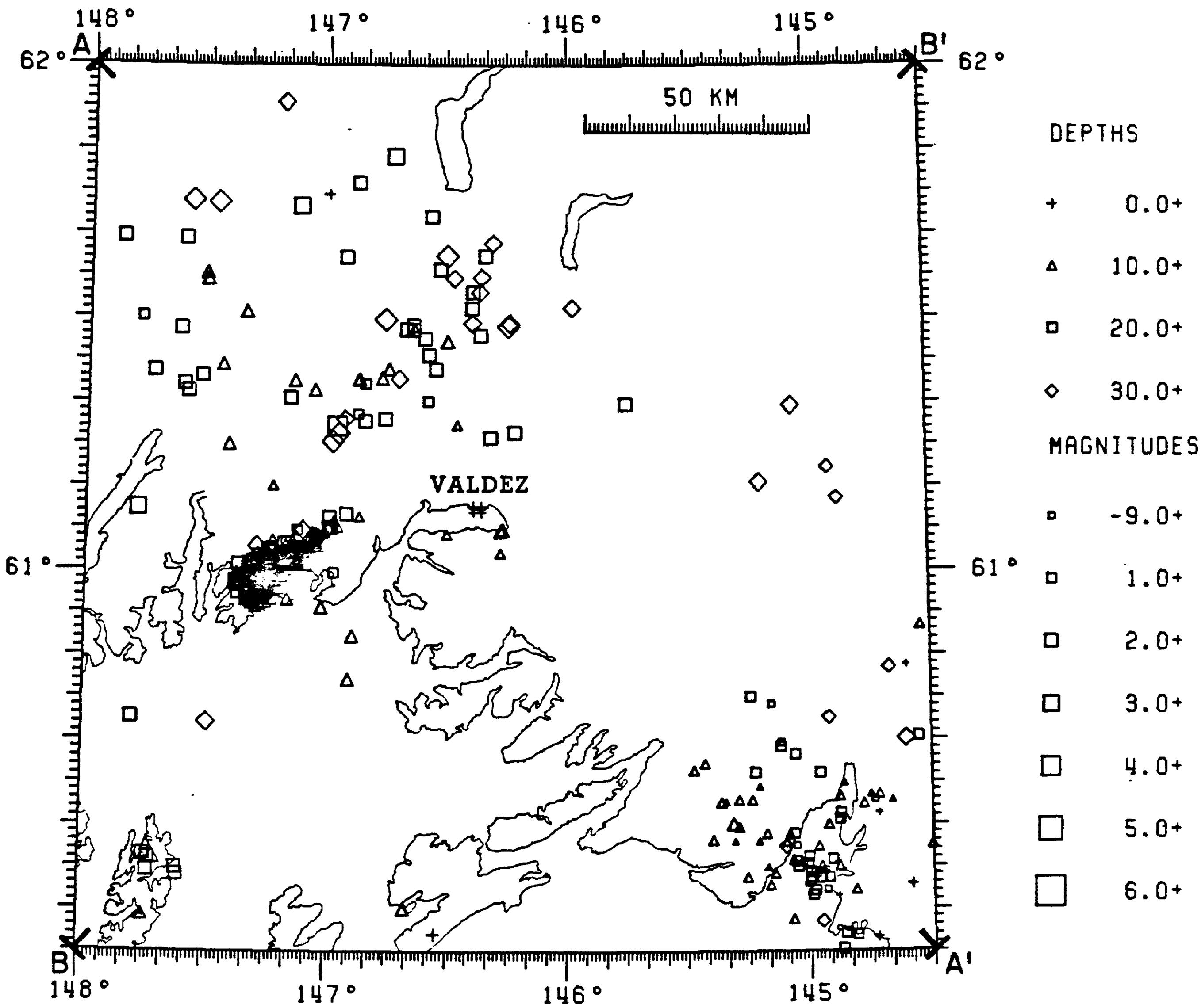

Figure 3. Map of earthquake epicenters for 1983. Letters indicate cross sections in Figure 4. Pronounced concentration of activity north of Prince William Sound is due to aftershocks of July and September Columbia Bay earthquakes.

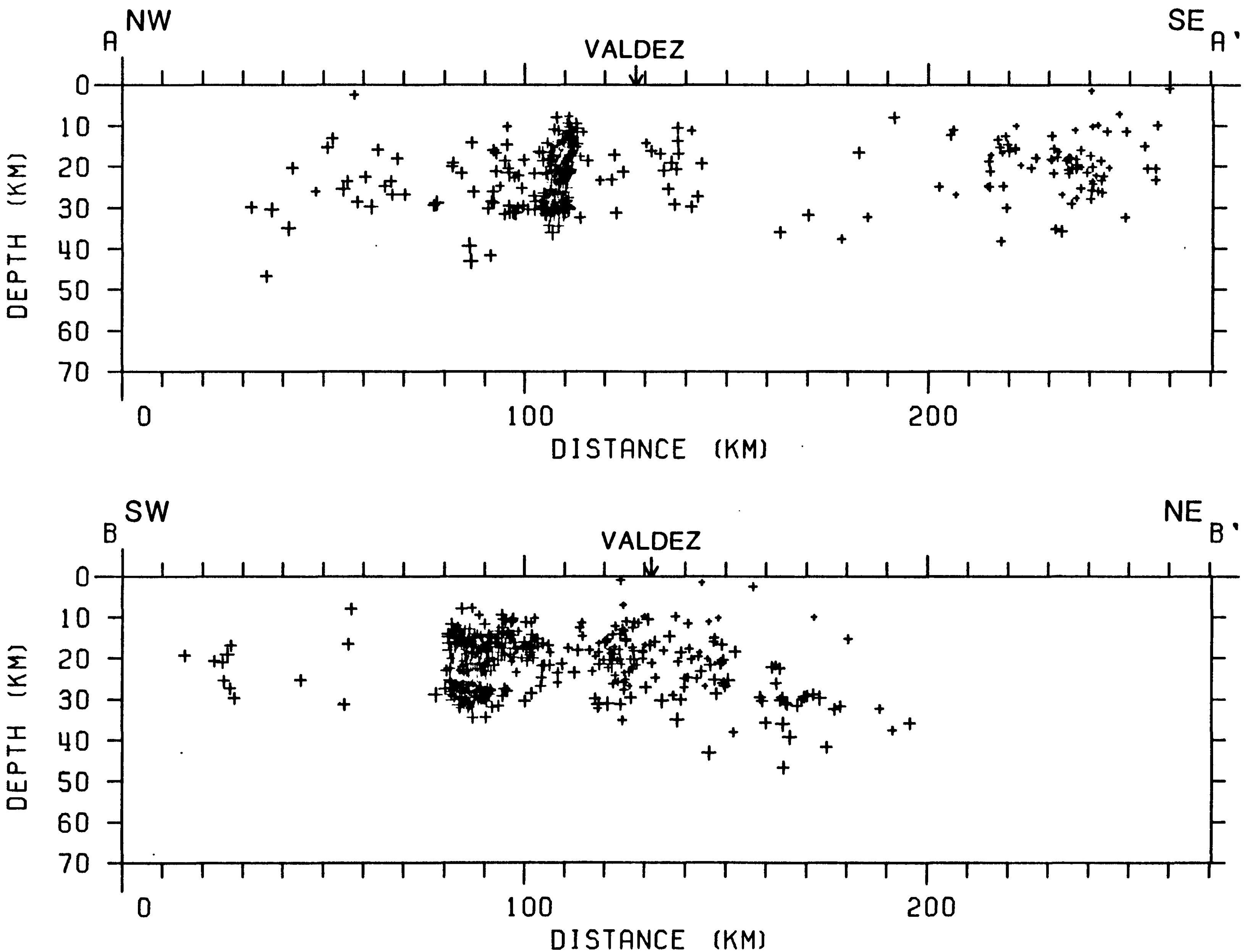

Figure 4. Cross sections of hypocenters of events in Figure 3. Section AA', view looking northeast; BB', view looking northwest.

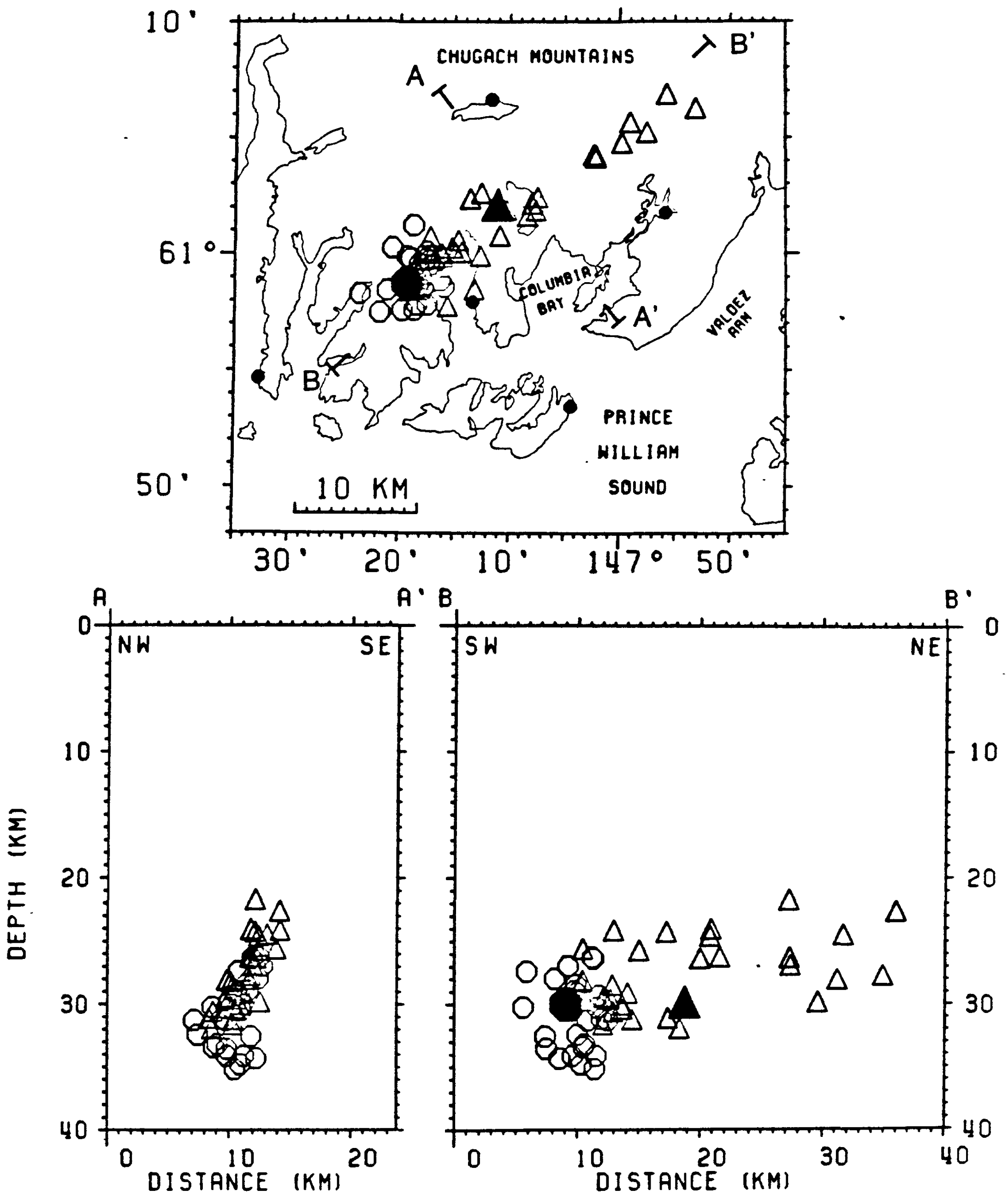

Figure 5. (Top) Epicenter map of well-located aftershocks of the July 12 and September 7 earthquakes (solid triangle and octagon, respectively). Open triangles, shocks from July 16-14; open octagons, shocks from September 12-14. Small solid circles indicate temporary local seismographs. Aftershocks are in the magnitude range 2.0-3.5. End points of vertical sections shown in bottom part of figure are indicated. (Bottom) Cross sections of mainshock and aftershock hypocenters. Symbols as in map. Left section is view looking to northeast along strike of aftershock zone. Right section is view looking to northwest in dip direction of aftershock zone.

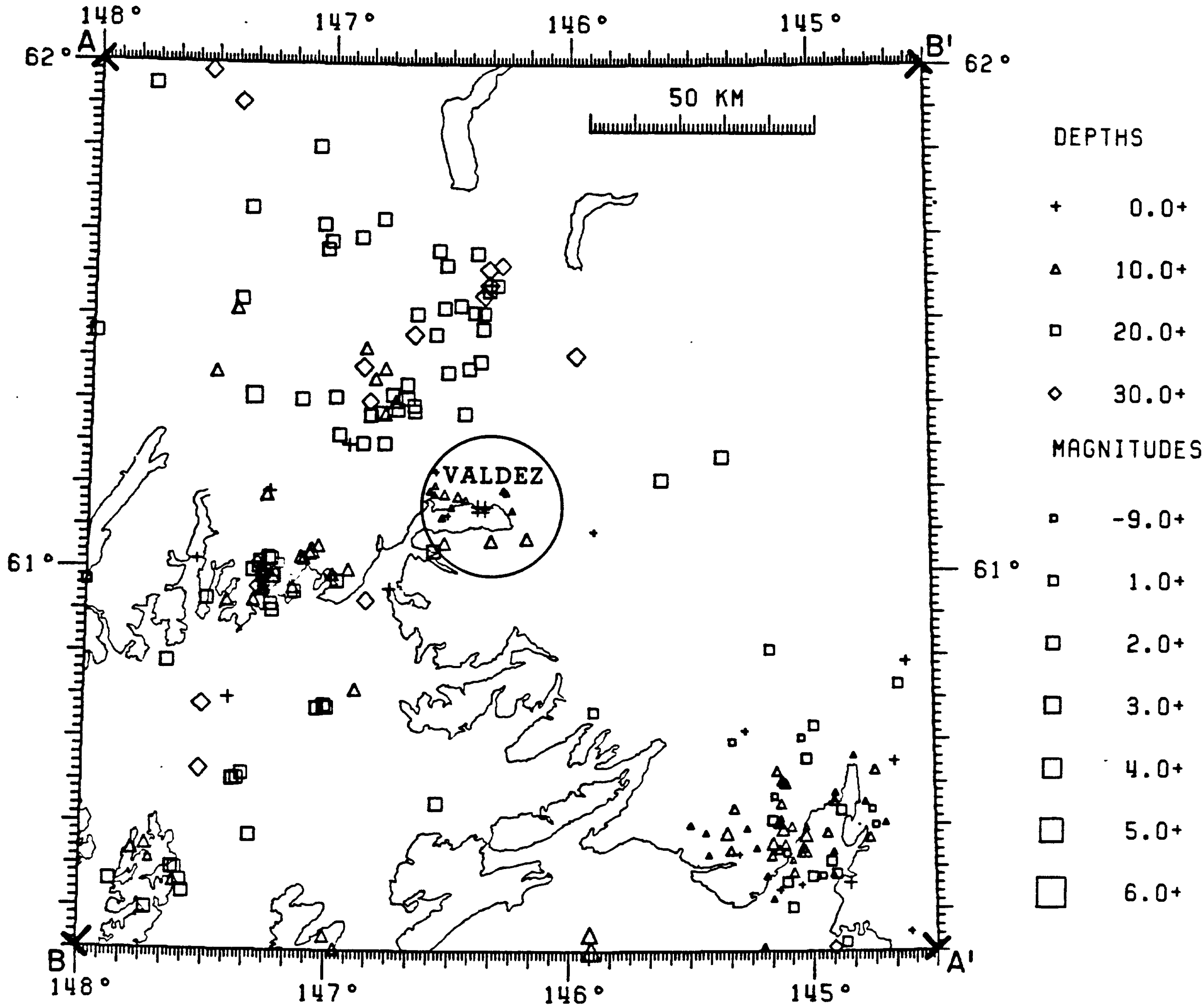

Figure 6. Map of earthquake epicenters for 1984. Circle indicates maximum epicentral distance (surface focus) for a 2 second P-to-S-phase time interval at seismograph station VLZ. Letters indicate cross sections in Figure 7.

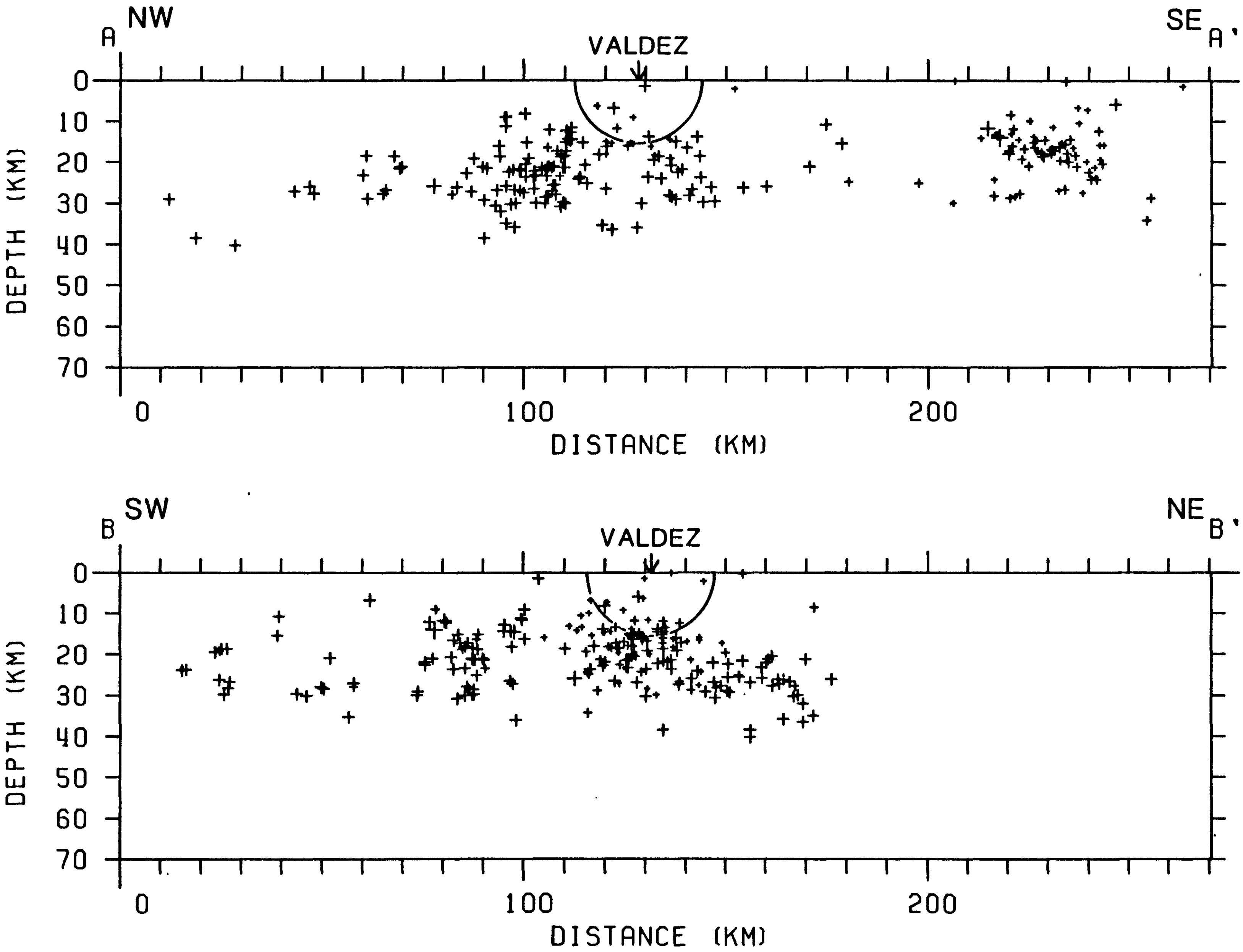

Figure 7. Cross sections of hypocenters of events in Figure 6. Section AA', view of looking northeast BB', view looking northwest. Semicircles indicates maximum hypocentral distance in plane of cross section for 2 second P-to-S-phase time interval at station VLZ.

of the July aftershock zone. The September hypocenters (Figure 5, octagons) defined a cluster about 6-9 km in diameter, lying in the depth range 26-35 km. The September aftershock zone did not appear to expand between the first and seventh days of the sequence. Although the two aftershock zones appear to overlap slightly, the September earthquake did not reactivate a substantial part of the July rupture zone. The smaller aftershock area for the September event suggests a smaller rupture zone; this pattern is consistent with the smaller surface-wave magnitude reported for that event. Although the September rupture zone was smaller, the aftershock sequence was more energetic than that after the July earthquake.

The focal mechanisms for both the July and September events determined from regional and teleseismic P-wave first-motions (Blackford and Fogleman, 1983) indicate normal, left-lateral oblique slip on the steeply northwest-dipping rupture plane defined by the aftershock hypocenters.

Based on the depth of the aftershock activity, the type of faulting, and the depth distribution of earthquakes associated with the Aleutian Benioff zone beneath Cook Inlet and the northern Kenai Peninsula, we surmise that the Columbia Bay earthquakes lie in the upper part of the subducting Pacific plate.

During 1984, aftershock activity of the 1983 Columbia Bay shocks appears to have occurred mainly in the rupture zone of the September 1983 earthquake. Only a few shocks were located near the epicenter of the July 1983 mainshock.

Tazlina Glacier

About 30 km north-northwest of Valdez is a 55-km-long southwest-northeast-trending concentration of seismicity centered in the vicinity of the Tazlina Glacier (Figure 2) which has persisted since at least 1971 when the initial network was established. This activity nominally ranges in depth from about 10-40 km. On January 1, 1983, a 5.3 m_b (M_D 4.0) shock occurred near the southern end of the zone. Although this event has a reported depth of 21 km, it has since been relocated at a depth of 37 km using a modified version of the standard model. On October 18, 1983, a 4.2 m_b (M_D 3.6) shock occurred at a depth of about 43 km near the center of the zone. Focal mechanisms for these two events both have a northeast-striking nodal plane similar in orientation and dip to the rupture plane of the July and September, 1983 Columbia Bay shocks; this suggests the possibility that the Tazlina Glacier events may have resulted from normal faulting on steeply northwest-dipping planes similar to the Columbia Bay events.

Copper River Delta

A conspicuous concentration of activity that has persisted for several years is located approximately 100 km southeast of Valdez near the mouth of the Copper River. The apparent high rate of activity is due in part to the lower magnitude threshold used in selecting events for processing east of about longitude 145°W. Most of the activity appears to be confined to the depth range 10-30 km. Relocated hypocenters from earlier time periods concentrate in the depth range of 20-25 km and many lie along a west-northwest trend that is oblique to mapped fault traces at the surface (Lahr and Stephens, 1983).

Knight Island

A cluster of seismicity is concentrated beneath the northern end of Knight Island near latitude 60.4°N, longitude 147.75°W. This feature is not as prominent as the Tazlina Glacier zone, however it has persisted since at least 1972. On June 5, 1983, a 4.7 m_b (M_D 3.6) shock occurred beneath the island; it was the largest event in this area since May 5, 1975 when a 4.8 m_b (4.7 M_S) earthquake occurred 30 km southeast of the 1983 shock.

Scattered Activity

Beneath Prince William Sound, south to southwest of Valdez, seismicity is diffuse and varies considerably in space and time.

Activity south of Hinchinbrook Island in the Gulf of Alaska consists of spatially and temporally isolated events and pairs of events. The largest event to occur in the study area during 1984 was a shallow 5.4 m_b (5.0 M_S, 4.2 M_D) shock on September 20, 20 km southeast of Hinchinbrook Island. This event was followed about 10 minutes later by a 5.1 m_b (4.6 M_S, 3.9 M_D) shock with nearly the same hypocentral location. The pair of events did not have a detectable aftershock sequence; however, single shocks of comparable magnitude and pairs of shocks have occurred previously in the surrounding region without significant aftershock activity. The September 20 shocks are the largest to occur offshore in this area since a 5.5 m_b event in May 1974. In 1969 two earthquakes (5.4 and 5.1 m_b) occurred a month apart in the same location as the 1984 pair.

Activity to the northwest of the Tazlina Glacier zone is less intense and more diffuse than that in the Tazlina Glazier zone; most of the events lie in the depth range 10-30 km. Since the USGS regional network began recording, this region has been characterized by diffuse seismicity.

Seismic Front

The seismicity appears to be bounded by a northwest-southeast trending line, which passes about 50 km northeast of Valdez. Such a line approximately delineates the northeastern terminus of the Aleutian Benioff zone (Stephens and others, 1984). Lahr (1975) and Davies (1975) suggest that this seismic front may coincide with the northeast edge of the subducted Pacific plate.

Crustal Activity near Valdez

Beginning in April 1984, all events with a P- to S-phase time interval of less than or equal to 2 seconds at the station VLZ that were recorded at three or more stations with a minimum of three P and one S arrivals were timed to investigate the distribution of small shallow crustal earthquakes near the city of Valdez. Of the 13 located events meeting these criteria, ten were clustered west of Valdez near Shoup Bay, while the remaining three shocks were located east of Valdez. Only two of these earthquakes, both near Shoup Bay, were shallower than 10 km. Until more data can be collected, little can be inferred about the nature of this activity.

Depth Distribution

Nearly all of the shocks located in the Valdez region for 1983-1984 lie in the depth range 10-35 km (Figures 4 and 7). In general, the tectonic significance of this activity is unclear due to uncertainties in the calculated depths and in the depth to and configuration of the Aleutian megathrust and due to the lack of focal mechanisms.

The deepening of the seismicity to the northeast (Figures 4 and 7, section BB') is probably associated with downwarping of the Pacific plate to the northeast, assuming these events lie in the subducted plate. The boundary between the Aleutian and Wrangell Benioff zones is uncertain; however, events deeper than 30 km and located east and southeast of Valdez are probably associated with the north-northeast-dipping Wrangell zone.

A comparison of the cross sections of the Columbia Bay aftershock hypocenters based on routine regional network locations (Figure 4) versus locations calculated from data recorded by the temporary local array (Figure 5) illustrates the poor depth control that exists for most of the study area. The routine aftershock locations show an apparent gap in activity at 25 km depth (Figure 4), which is not seen in the well-constrained depths determined from the temporary array (Figure 5). In addition, the routinely located aftershocks range in depth from about 10 to 32 km, whereas the well-constrained hypocenters range from 22 to 35 km.

Only 28 earthquakes in the study area were located at depths shallower than 10 km. These events were scattered throughout most of the area and are too few to investigate the relationship of shallow crustal activity to mapped faults. As a general observation, it appears that little of the seismicity in the Valdez study area is occurring at shallow crustal depths where it might be readily correlated with faults that are mapped at the surface.

DISCUSSION

In summary, 699 earthquakes were located in the Valdez study area for the period 1983-1984. All but 28 of these were located at depths deeper than 10 km.

The interface between the subducting and overriding plates beneath Port Valdez is not clearly expressed by the earthquake data. By extrapolating the depth distribution of earthquakes beneath upper Cook Inlet and northern Kenai Peninsula, the megathrust can be inferred to be shallower than 20 or 30 km beneath northern Prince William Sound (Page and others, 1985). However, with few exceptions, it is not possible to differentiate between specific earthquakes or earthquake clusters occurring in the lower part of the overriding American plate, in the upper part of the subducting Pacific plate, or on the megathrust separating the plates.

The relocation of existing data with improved velocity models and relative location techniques may help clarify the nature of the seismicity. New information on the velocity structure in the Valdez study area will be available from the Trans-Alaska Crustal Transect (TACT) program (Page and others, 1986). In addition by supplementing (for 1- or 2-year intervals) the sparse regional seismic network in areas of persistent seismicity with a few additional stations spaced at 20-30 km intervals, we will be able to resolve the depth distribution of local shocks to within 2 or 3 km. This strategy was implemented in the Copper River Delta area in 1984-1985 and in the Knight Island area in 1985-1986.

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APPENDIX A

1983 Valdez Area Earthquakes

Earthquakes in the Valdez region are listed in chronological order. The following data are given for each event in Appendices A, B, and C:

1. Origin time in Universal Time (UT): date, hour (HR), minute (MN), and second (SEC).

2. Epicenter in degrees and minutes of north latitude (LAT N) and west longitude (LONG W).

3. DEPTH, depth of focus in kilometers

4. MAG, magnitude of the earthquake, coda duration magnitude (M_D) unless noted otherwise. A letter following the magnitude indicates a magnitude other than M_D as follows:

   A - Amplitude magnitude (XMAG), USGS.
   B - Body-wave magnitude (m_b), USGS National Earthquake Information Center (NEIC).
   S - Surface-wave magnitude (M_S), NEIC.

5. NP, number of P arrivals used in locating earthquake.

6. NS, number of S arrivals used in locating earthquake.

7. GAP, largest azimuthal separation in degrees between stations.

8. D1, epicentral distance in kilometers to the station closest to the epicenter.
9. RMS, root-mean-square traveltime residual in seconds:

$$RMS = \left[\frac{\sum^{N} W_i [R_i]^2}{N} \right]^{1/2}$$

where R_i is the observed minus computed arrival time of the i^{th} arrival, W_i is the corresponding weight of the arrival, and the weights are normalized so that their sum equals N, the total number of P, S, and S-P readings used in the solution.

10. SEH, standard error in kilometers in the horizontal direction with least control. SEH = MAXH/1.87, where MAXH is the largest horizontal deviation in kilometers of the one-standard-deviation confidence ellipsoid (see Figure 8 below). In previous catalogs MAXH was referred to as ERH. Values of SEH that exceed 25 km are tabulated as 25 km.

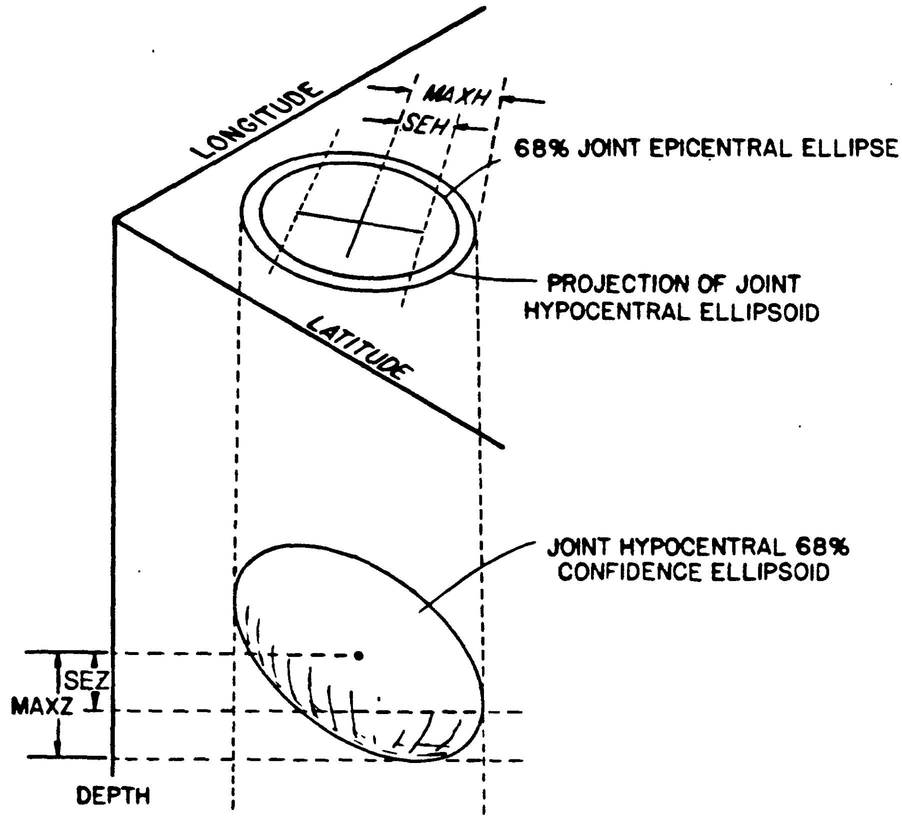

Figure 8. Relationship between the confidence ellipsoid and SEH, MAXH, SEZ, and MAXZ. The projected ellipse has the same orientation and eccentricity as the joint epicentral 68-percent confidence region, but has 1.23 times longer axes. The error ellipsoids are calculated assuming a constant standard deviation of 0.16 sec for the arrival time readings.

11. SEZ, standard error in kilometers of depth. SEZ = MAXZ/1.87 where MAXZ is the largest vertical deviation in kilometers of the one-standard-deviation confidence ellipsoid (see Figure 8). In previous catalogs MAXZ was referred to as ERZ. Values of SEZ that exceed 25 km are tabulated as 25 km.

12. Q, quality of the hypocenter. This index is a measure of the precision of the hypocenter (see section Analysis of Hypocentral Quality) and is calculated from SEH and SEZ as follows:

1983 VALDEZ AREA EARTHQUAKES

1983		ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
JAN	1	11	18	8.3	61	17.2	146	57.3	21.5	4.0	23	1	75	38	0.56	0.5	1.0	A	293	2	0.6	202	10	1.0	34	80	2.0
				5.3 MB							FELT (IV) AT VALDEZ AND (III) AT ANCHORAGE, CORDOVA, GLENNALLEN, AND PALMER.																
	1	14	29	59.6	60	40.3	144	33.1	21.6	1.6	8	8	90	33	0.32	0.9	1.0	A	158	10	0.6	81	39	1.1	261	48	2.1
	1	21	10	2.1	61	16.3	146	57.0	31.2	3.0	22	4	74	37	0.59	0.5	0.6	A	208	7	0.9	299	9	0.6	81	79	1.2
	3	8	41	59.9	60	22.2	144	49.0	11.3	1.2A	9	4	214	28	0.78	1.2	0.9	A	115	6	0.7	206	6	2.3	341	81	1.7
	3	15	3	4.6	61	18.0	146	45.4	27.1	2.3	17	7	76	30	0.63	0.6	0.9	A	293	5	0.6	24	10	1.0	177	79	1.7
	8	4	10	22.8	61	28.6	146	39.9	28.6	2.2	18	9	87	40	0.68	0.4	1.0	A	198	2	0.8	288	12	0.6	99	78	1.9
	15	14	16	46.8	61	27.3	146	29.7	18.3	2.8	19	7	80	31	0.82	0.6	1.0	A	23	1	1.1	293	5	0.7	124	85	1.8
	17	22	0	25.2	61	55.6	147	11.4	46.7	2.7	11	5	96	57	0.40	1.4	3.2	C	261	6	1.2	160	9	2.3	21	75	6.1
	23	1	15	38.9	60	17.1	144	51.7	20.4	1.1	12	7	185	34	0.40	1.1	0.9	A	10	5	2.0	102	20	0.8	267	69	1.9
	26	1	32	52.0	60	15.2	144	52.2	23.1	1.8	18	3	187	35	0.51	1.0	0.9	A	106	13	0.7	6	37	2.2	212	50	1.4
	31	2	40	20.6	60	45.1	145	14.4	24.9	1.0A	5	2	161	24	0.16	0.9	1.1	A	214	8	1.3	306	14	1.6	95	74	2.2
	31	23	52	46.0	60	42.7	144	55.0	38.2	1.1A	4	4	172	25	0.10	1.4	1.6	B	81	27	0.9	170	34	1.4	314	48	3.6
FEB	1	15	17	11.0	61	33.1	146	21.6	31.2	2.4	19	5	85	24	0.70	0.6	0.7	A	148	4	0.7	261	22	0.9	50	58	1.3
	4	4	9	46.6	60	27.9	145	5.8	15.7	1.5A	11	7	175	10	0.38	1.0	0.9	A	200	30	1.3	88	33	0.9	322	42	2.3
	4	13	47	7.4	60	32.5	144	46.8	19.5	1.0A	10	8	133	23	0.46	0.7	1.0	A	357	5	1.0	90	32	0.7	259	58	2.1
	4	14	8	4.7	60	18.8	145	4.2	11.3	1.1A	8	5	241	26	0.44	1.5	1.6	B	227	10	2.3	128	40	0.9	328	48	3.9
	5	4	13	21.5	60	31.4	144	43.0	1.5	0.9A	7	4	144	27	0.40	1.8	11.1	D	41	0	1.3	131	9	0.8	311	81	21.0
	7	6	29	45.4	60	25.6	145	3.4	20.2	1.5	11	4	166	15	0.44	0.7	0.8	A	209	1	1.3	118	24	0.7	301	66	1.7
	11	23	6	0.8	61	31.2	146	23.6	22.1	2.3	18	11	86	25	1.00	0.5	0.9	A	206	6	0.9	297	9	0.6	83	79	1.8
	15	12	26	37.0	61	22.6	147	8.1	19.1	2.3	16	8	84	51	0.40	0.6	0.9	A	278	6	0.5	185	25	1.0	21	64	1.9
	15	17	58	36.4	60	36.2	145	13.4	21.1	1.5	10	7	84	8	0.44	0.9	0.9	A	135	9	0.7	81	38	0.9	236	39	1.7
	17	19	38	36.7	60	48.8	144	36.0	9.9	0.7A	5	4	161	17	0.19	1.0	1.9	B	262	12	1.6	168	17	0.7	25	69	3.7
	18	13	41	28.5	60	18.6	144	57.1	32.3	1.2	8	7	215	29	0.74	0.8	0.9	A	115	5	1.0	209	36	1.4	18	54	1.8
	19	7	41	42.2	61	23.1	147	31.6	23.6	2.2	18	7	84	50	0.38	0.7	0.7	A	103	4	0.5	195	37	1.0	8	53	1.6
	20	1	47	23.9	61	44.7	146	60.0	2.4	1.9	15	7	129	59	0.71	0.4	0.8	A	271	10	0.5	178	13	0.8	37	73	1.5
	21	14	52	36.5	61	10.1	147	13.3	10.1	1.9	17	12	97	48	0.71	1.0	1.4	B	269	15	0.6	172	25	1.3	27	60	2.9
	22	1	26	12.9	60	28.9	145	10.6	17.9	1.5	7	5	190	6	0.37	1.1	0.8	A	81	23	0.9	159	37	2.0	319	46	1.4
	24	3	5	16.6	61	29.4	146	23.5	30.5	2.1	14	9	80	25	0.79	0.6	1.2	A	319	4	0.6	261	18	0.8	61	54	2.0
	24	20	50	57.0	60	42.7	147	47.8	25.2	2.2	21	9	133	69	0.39	0.8	2.1	B	261	6	0.6	166	13	1.2	15	75	4.0
	27	7	8	12.3	61	16.5	146	12.8	21.3	2.1	17	9	63	17	0.84	0.4	0.7	A	190	2	0.7	280	10	0.7	89	80	1.3
	27	12	40	58.3	61	24.0	146	44.3	18.6	2.2	16	8	82	37	0.62	0.5	0.9	A	287	10	0.4	195	12	0.8	56	74	1.8
MAR	8	8	25	21.9	61	38.9	146	18.2	41.7	2.5	19	10	91	27	0.68	0.7	2.0	B	296	1	0.7	206	9	1.1	32	81	3.7
	9	5	51	51.3	61	35.3	147	30.6	15.3	2.2	18	11	110	50	0.43	0.5	0.9	A	262	8	0.5	170	14	0.9	21	74	1.7
	9	5	53	28.0	61	34.6	147	30.4	13.1	2.4	19	10	108	51	0.58	0.6	0.8	A	263	14	0.6	167	24	0.9	21	62	1.6
	9	15	5	39.2	60	22.8	144	35.2	9.8	1.6	17	11	182	19	0.84	0.6	0.5	A	115	18	0.4	217	32	1.2	0	52	0.8
	11	19	17	24.6	60	34.5	145	12.3	16.7	0.5	7	3	159	5	0.29	1.5	1.7	B	0	18	1.3	99	26	2.5	239	58	3.4
	12	3	52	58.2	61	27.9	146	21.3	29.5	2.1	20	7	77	23	0.93	0.5	0.7	A	291	1	0.5	21	14	0.8	197	76	1.4
	12	8	25	24.4	60	28.1	145	18.6	19.5	0.8A	4	4	277	9	0.37	2.1	0.8	B	304	4	4.0	213	19	2.1	45	71	1.4
	13	16	6	49.2	60	25.5	144	53.2	9.8	0.9A	10	9	181	21	0.53	0.8	0.9	A	113	15	0.6	14	32	1.3	225	54	1.8
	13	16	8	41.4	60	27.4	144	58.0	18.2	1.7	18	8	120	16	0.68	0.5	0.6	A	21	14	0.8	118	27	0.5	266	59	1.4
	14	3	44	15.9	61	24.4	147	26.4	18.0	2.3	20	11	86	54	0.45	0.7	0.9	A	274	5	0.6	182	24	1.1	15	65	1.8
	15	6	45	10.0	61	10.6	145	11.9	31.8	2.4	20	15	94	9	0.63	0.4	0.5	A	359	22	0.7	98	23	0.6	230	57	1.0
	15	20	48	21.9	60	32.9	144	44.1	20.1	0.8A	7	5	135	26	0.31	0.8	1.5	A	136	9	0.7	81	16	1.0	260	51	2.4
	16	6	54	28.4	60	21.5	144	53.3	7.1	0.9	10	4	224	26	0.59	1.3	1.0	A	118	13	0.7	23	21	2.4	238	65	1.9
	17	9	12	13.6	61	18.0	146	55.4	31.2	2.1	17	11	94	37	0.69	0.5	0.6	A	268	2	0.5	176	36	0.7	1	54	1.2
	17	16	42	36.3	60	29.7	145	17.5	15.9	1.8	15	4	129	6	0.32	0.7	1.0	A	9	7	1.3	101	22	0.7	262	67	2.0
	17	16	45	32.9	60	29.7	145	17.4	15.4	1.6	11	8	141	6	0.49	0.7	0.6	A	199	4	1.2	108	22	0.6	299	68	1.2
	17	16	47	35.7	60	28.1	145	23.8	14.5	1.5	10	7	201	13	0.23	1.2	0.7	A	81	20	1.9	147	39	0.9	324	42	1.3
	19	1	26	59.3	60	31.3	144	52.5	20.7	1.3	12	9	153	18	0.46	0.8	0.8	A	121	23	0.6	13	36	0.8	236	45	2.0

Q	Larger of SEH and SEZ (km)
A	≤ 1.34
B	≤ 2.67
C	≤ 5.35
D	> 5.35

13. AZ1, DIP1, and SE1 are the azimuth in degrees (clockwise from north), dip in degrees, and standard error in kilometers of the most nearly horizontal of the three principal semi-axes of the one-standard-deviation error ellipsoid. Values of SE1 that exceed 25 km are tabulated as 25 km.

14. AZ2, DIP2, and SE2 are defined as above, but correspond to the principal semi-axis of intermediate dip.

15. AZ3, DIP3, and SE3 are defined as above, but correspond to the most nearly vertical principal semi-axes.

Magnitudes and felt reports listed below an event were obtained from the Preliminary Determination of Epicenters of the USGS National Earthquake Information Center (NEIC). The body-wave (m_b) and surface-wave (M_S) magnitudes are those determined by the NEIC.

1983 VALDEZ AREA EARTHQUAKES

1983	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
MAR 19	1	34	17.9	60	36.1	144	57.3	20.2	1.5	10	6	114	16	0.31	0.5	0.7	A	356	12	0.6	93	31	0.7	247	56	1.4
22	12	35	13.0	60	25.8	145	4.2	17.8	1.0	13	7	121	14	0.56	0.6	0.6	A	207	9	1.0	112	28	0.6	313	60	1.3
23	11	29	29.8	61	28.6	146	38.1	16.7	2.1	22	10	86	38	0.74	0.4	0.7	A	277	2	0.5	187	11	0.7	17	79	1.3
25	23	42	20.5	61	35.8	146	31.6	26.0	2.4	20	13	93	34	0.80	0.5	0.9	A	290	0	0.5	20	8	0.9	200	82	1.7
27	19	24	35.4	61	34.8	146	21.2	31.5	2.0	11	7	116	50	0.47	1.0	0.8	A	359	6	1.1	90	11	1.9	241	77	1.5
29	11	41	26.9	60	17.0	146	32.5	8.0	2.3	22	9	83	13	0.60	0.5	0.5	A	149	26	0.9	261	30	0.6	28	46	1.1
APR 3	10	53	1.8	60	32.6	145	20.7	17.2	0.9A	8	5	128	8	0.52	0.6	0.6	A	351	0	1.1	81	26	0.7	261	64	1.1
10	6	45	40.5	61	30.1	147	46.7	25.9	1.9	15	8	91	38	0.82	0.6	1.3	A	261	2	0.8	170	16	1.0	358	74	2.4
11	9	3	19.2	61	22.2	147	36.0	24.8	2.5	20	7	80	46	0.36	0.5	0.8	A	280	6	0.5	188	17	0.9	29	72	1.6
12	3	51	28.1	60	24.3	144	58.7	27.9	1.2A	6	4	232	19	0.29	2.8	2.4	C	191	3	3.9	284	39	6.7	97	51	1.8
12	3	52	14.2	60	22.2	144	58.8	26.4	1.5A	7	5	225	22	0.37	2.0	1.2	B	214	15	3.8	118	23	0.9	334	62	2.4
12	3	56	43.7	60	23.7	144	55.7	23.4	1.2A	7	4	216	22	0.43	1.4	1.5	B	12	17	2.4	112	29	1.0	256	55	3.3
12	4	5	35.8	60	23.6	144	57.3	25.9	1.5A	7	4	219	21	0.44	1.3	1.1	A	118	20	0.8	220	29	2.6	359	54	2.0
15	17	49	17.9	60	39.3	145	7.0	24.9	1.1A	7	6	135	14	0.56	0.9	0.9	A	141	18	0.9	36	39	1.1	250	46	2.2
15	21	55	12.1	60	39.7	145	6.9	24.8	0.9A	8	5	73	15	0.38	1.0	1.3	A	145	19	0.9	81	36	1.2	263	43	2.3
19	4	43	36.4	61	15.4	146	58.5	31.2	3.4	21	5	73	37	0.51	0.6	0.8	A	287	3	0.6	196	19	1.0	26	71	1.5
	4.0 MB									FELT (III) AT VALDEZ, (II) AT PALMER AND (I) AT ANCHORAGE.																
22	11	40	48.4	60	26.1	145	0.4	20.3	1.3	11	7	163	16	0.48	0.6	0.6	A	205	14	1.1	108	26	0.6	321	60	1.3
22	16	53	48.9	60	24.1	144	58.5	23.5	0.9A	7	6	219	20	0.43	1.2	0.9	A	225	26	2.4	119	28	0.8	350	50	1.8
22	21	21	18.1	61	27.5	146	35.3	20.5	2.3	13	6	99	39	0.93	0.5	1.0	A	27	0	1.0	297	6	0.5	117	84	2.0
24	6	25	14.0	61	43.3	147	7.2	25.4	3.1	17	4	76	65	0.54	0.7	1.0	A	179	8	1.2	87	14	0.9	298	74	2.0
										FELT AT SHEEP MOUNTAIN LODGE.																
25	22	16	20.3	60	34.9	144	51.6	18.5	0.6A	6	3	125	20	0.08	1.1	1.8	B	42	14	0.9	139	25	1.1	286	61	3.7
26	14	27	38.9	60	24.4	145	0.0	21.5	1.2	8	5	170	18	0.43	0.7	0.8	A	25	22	1.2	125	23	0.6	256	57	1.6
27	22	28	45.9	60	16.9	144	48.8	20.4	1.1	10	6	234	31	0.29	1.1	1.2	A	39	9	2.0	133	26	1.0	291	62	2.5
MAY 4	17	55	30.7	60	25.0	144	53.0	18.5	1.7	13	10	165	22	0.56	0.7	0.8	A	6	22	1.2	109	29	0.6	245	52	1.7
4	17	58	23.8	60	22.2	144	56.0	20.3	0.9A	8	6	223	24	0.46	1.4	1.3	B	117	26	0.9	7	35	2.3	235	44	3.0
5	6	9	4.8	61	37.4	146	29.8	39.2	3.0	21	10	95	34	0.82	0.6	2.5	B	295	2	0.8	205	3	1.2	59	86	4.6
										FELT AT VALDEZ.																
8	18	21	29.2	61	17.3	146	27.2	11.6	1.9	21	10	68	19	0.73	0.4	0.5	A	12	3	0.7	282	5	0.5	133	84	1.0
9	8	0	33.3	61	4.9	146	15.7	16.8	2.1	22	9	50	7	0.37	0.4	0.6	A	81	5	0.7	156	19	0.7	336	65	1.1
9	14	56	30.5	61	4.8	146	16.4	10.4	2.4	22	5	50	7	0.53	0.5	0.6	A	117	15	0.7	213	22	0.9	355	63	1.2
										FELT (III) AT VALDEZ.																
16	12	27	2.9	61	28.6	147	37.0	23.6	2.2	16	14	92	45	0.55	0.5	0.7	A	111	8	0.6	203	13	0.9	350	75	1.3
19	4	31	21.1	60	24.9	147	36.3	29.6	2.9	26	7	100	61	0.53	0.7	0.8	A	261	11	0.6	358	30	1.2	153	58	1.5
19	5	32	25.6	60	21.6	144	59.3	22.4	1.0	9	7	203	23	0.49	2.0	1.0	B	25	0	3.8	115	19	0.8	295	71	2.0
26	11	15	26.8	60	25.0	145	3.1	20.6	1.2	12	8	168	16	0.52	0.6	0.9	A	27	5	1.2	118	17	0.7	281	72	1.7
27	3	38	25.3	60	23.6	144	59.8	25.8	1.1A	9	4	221	19	0.42	1.4	1.3	B	13	26	2.4	120	31	1.0	251	47	3.0
29	6	35	7.2	61	2.2	146	16.4	11.2	1.9	20	14	61	11	0.63	0.4	0.5	A	101	5	0.5	194	27	0.6	1	62	1.0
JUN 4	3	1	46.8	61	25.5	146	34.3	25.3	2.9	23	6	80	35	0.79	0.5	0.9	A	284	1	0.6	14	4	0.8	180	86	1.7
5	0	34	31.8	61	15.9	146	18.9	23.3	2.4	24	18	64	15	0.76	0.3	0.6	A	268	2	0.6	178	2	0.6	43	87	1.1
5	21	48	7.2	60	26.2	147	41.8	19.1	3.6	27	2	100	59	0.47	0.7	1.3	A	269	14	0.8	175	16	1.1	38	69	2.6
	4.7 MB																									
8	23	23	12.5	61	39.4	147	36.1	20.3	2.2	21	12	122	42	0.55	0.5	0.9	A	261	0	0.6	170	13	0.8	351	77	1.7
11	8	11	47.3	60	27.5	144	30.0	15.0	1.2	10	8	131	19	0.67	1.0	0.9	A	122	1	0.6	213	44	2.4	31	46	0.8
12	10	21	10.6	60	30.1	145	18.9	16.2	2.1	23	14	64	7	0.63	0.3	0.5	A	16	5	0.6	108	22	0.4	274	67	1.0
13	0	16	37.8	60	27.5	147	43.3	16.8	2.1	22	9	149	56	0.52	0.8	1.2	A	284	4	0.6	192	28	1.0	21	62	2.4
16	12	53	1.8	61	15.1	147	24.4	19.9	2.5	22	9	72	59	0.39	0.5	0.8	A	277	4	0.5	186	14	0.9	23	75	1.6
18	11	17	42.0	60	55.7	147	1.0	17.2	2.1	17	7	82	43	0.53	0.6	1.2	A	284	10	0.6	191	14	1.0	48	73	2.4
27	7	58	53.2	60	56.7	147	9.6	18.5	2.5	23	9	70	49	0.52	0.4	0.7	A	170	1	0.7	261	9	0.4	74	81	1.3
30	20	5	26.5	60	22.8	145	9.9	18.0	1.5A	8	4	247	17	0.26	1.0	1.0	A	132	23	0.8	235	29	1.8	10	52	2.0

1983 VALDEZ AREA EARTHQUAKES

1983	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	DI KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
JUL 3	13	13	55.4	60	23.8	145	15.5	12.5	1.3A	4	3	248	56	0.12	3.1	2.5	C	126	4	1.4	217	13	5.9	19	76	4.6
4	11	13	10.2	61	37.3	146	20.2	28.9	2.4	19	13	88	26	1.23	0.6	0.5	A	281	22	0.6	24	29	1.1	160	52	0.8
10	23	46	14.0	61	29.3	146	14.0	30.8	2.4	17	9	99	40	0.78	0.5	0.6	A	294	24	0.7	188	32	0.8	54	48	1.2
12	8	59	12.0	61	22.1	146	50.4	24.7	1.2A	6	3	132	38	0.24	0.8	1.9	B	10	8	1.4	279	9	0.6	141	78	3.6
12	11	42	25.7	61	18.6	146	52.1	22.7	1.8	12	8	122	35	0.72	0.7	0.9	A	283	8	0.5	192	9	1.4	54	78	1.7
12	15	10	4.3	61	1.7	147	8.8	17.5	6.4S	30	1	43	46	0.47	0.5	0.9	A	190	8	0.8	281	11	0.6	64	76	1.8
6.1 MB 6.4 MS										DAMAGE (VI) AT VALDEZ. FELT (V) AT CHITINA, CHUGIAK, COOPER LANDING, COPPER CENTER, CORDOVA, FORT RICHARDSON, GAKONA, GIRDWOOD, MOOSE PASS, SKWENTNA, SUTTON, WHITTIER, AND WILLOW. FELT (IV) AT ANCHORAGE, PALMER AND SEWARD. FELT (III) AT FAIRBANKS AND YAKUTAT. ALSO FELT (III) AT WHITEHORSE, YUKON																
12	15	22	1.1	61	1.4	147	9.2	13.4	3.2	19	15	79	46	0.69	0.3	0.7	A	281	8	0.4	190	11	0.6	47	76	1.3
12	15	26	13.2	61	2.0	147	10.6	20.4	2.7	18	12	79	47	0.58	0.3	0.9	A	277	4	0.4	186	4	0.6	52	84	1.6
12	15	33	4.0	61	1.3	147	13.5	28.3	2.7	15	13	94	50	0.52	0.3	0.7	A	283	0	0.4	193	2	0.6	13	88	1.2
										FELT (III) AT VALDEZ AND (II) AT ANCHORAGE.																
12	15	36	5.0	60	59.6	147	17.0	17.6	2.9	17	13	84	54	0.55	0.4	1.0	A	286	8	0.4	195	10	0.6	54	77	1.9
12	15	42	53.5	61	1.1	147	14.6	29.3	2.8	15	13	95	51	0.52	0.3	0.6	A	290	0	0.4	200	2	0.6	20	88	1.1
12	15	44	16.1	61	1.8	147	10.1	31.6	2.1	15	13	79	47	0.93	0.4	0.6	A	93	7	0.4	185	14	0.7	337	74	1.1
12	15	45	29.2	61	2.6	147	13.8	21.8	2.0	12	10	92	49	0.48	0.4	0.9	A	171	3	0.7	262	8	0.4	61	81	1.8
12	15	49	1.1	61	2.3	147	9.4	29.3	2.0	14	9	78	46	0.66	0.4	0.7	A	281	1	0.6	191	3	0.8	29	87	1.2
12	15	55	14.0	61	4.7	147	2.5	17.7	1.9	17	14	73	39	0.47	0.5	1.1	A	282	10	0.5	189	15	0.8	44	72	2.1
12	15	57	39.7	61	0.9	147	13.7	21.2	2.2	17	12	81	50	0.40	0.4	1.0	A	182	3	0.7	272	4	0.5	55	85	1.9
12	15	58	35.0	61	0.8	147	10.7	15.2	2.6	18	14	80	48	0.71	0.4	0.8	A	273	7	0.4	181	9	0.6	40	78	1.6
12	16	9	47.9	61	0.1	147	15.6	19.6	2.3	16	14	96	52	0.47	0.3	0.7	A	277	5	0.4	186	9	0.6	36	80	1.4
12	16	20	46.3	61	0.6	147	14.5	19.1	2.3A	21	17	82	51	0.44	0.4	0.8	A	289	5	0.5	198	11	0.6	43	78	1.6
12	16	20	52.7	60	58.6	147	17.8	8.0	2.4	12	5	108	55	0.34	0.8	1.6	B	179	4	1.4	269	6	1.1	55	83	3.0
12	16	24	42.5	61	1.0	147	13.4	18.0	2.0	20	7	81	50	0.51	0.4	1.0	A	189	3	0.7	280	9	0.5	81	80	2.0
12	16	25	33.0	61	2.7	147	8.5	14.0	1.8	18	12	90	45	0.54	0.4	1.0	A	181	3	0.8	272	5	0.5	60	84	1.8
12	16	34	58.6	61	2.6	147	6.8	15.3	2.0	21	13	77	43	0.52	0.4	0.7	A	280	3	0.4	189	12	0.6	24	78	1.4
12	16	43	15.5	61	2.0	147	14.5	14.4	2.0	21	14	80	50	0.55	0.3	0.6	A	173	6	0.6	264	11	0.4	55	77	1.2
12	16	49	30.6	61	2.4	147	14.3	28.0	2.3	18	13	93	50	0.56	0.3	0.7	A	287	1	0.4	197	11	0.6	22	79	1.2
12	17	2	6.1	61	2.4	147	5.2	16.2	2.3	18	13	89	42	0.50	0.3	0.8	A	293	3	0.4	203	8	0.6	43	81	1.5
12	17	38	23.4	61	0.4	147	11.8	20.0	2.4	17	14	94	49	0.37	0.4	1.0	A	278	4	0.5	187	10	0.7	29	79	1.9
12	17	40	57.5	61	0.2	147	10.0	14.8	2.4	17	10	94	47	0.58	0.3	0.6	A	268	8	0.4	177	9	0.6	39	78	1.2
12	17	50	27.8	61	3.7	147	3.5	15.9	2.0	18	16	74	40	0.50	0.4	1.0	A	275	4	0.4	185	5	0.6	44	84	1.9
12	17	55	6.2	61	3.0	147	10.1	19.5	2.1	18	14	90	46	0.47	0.4	0.7	A	290	9	0.4	198	13	0.6	54	74	1.4
12	17	56	48.6	61	4.3	147	1.8	14.3	2.7	15	14	85	38	0.55	0.3	0.6	A	272	10	0.4	179	15	0.6	34	72	1.2
12	18	0	37.8	61	3.4	147	5.6	18.0	1.8	18	12	88	42	0.46	0.4	0.9	A	304	8	0.5	212	11	0.6	69	76	1.8
12	18	27	21.6	61	4.2	147	1.9	16.0	2.0	17	9	73	38	0.51	0.4	1.1	A	308	3	0.5	218	7	0.6	61	82	2.0
12	19	2	8.2	61	2.5	147	12.1	16.3	2.4	18	11	92	48	0.54	0.3	0.9	A	189	4	0.6	280	8	0.5	73	81	1.7
12	19	4	15.0	61	1.1	147	13.0	20.0	3.2	20	10	81	49	0.47	0.5	1.0	A	185	9	0.8	277	14	0.5	63	73	1.9
12	19	12	37.5	61	0.7	147	13.1	27.9	2.0	17	14	81	50	0.52	0.3	0.7	A	98	2	0.4	188	4	0.6	341	86	1.3
12	19	18	19.1	61	4.6	147	0.3	15.3	2.2	16	12	84	37	0.49	0.3	0.8	A	299	4	0.4	208	7	0.6	58	82	1.5
12	19	51	1.5	61	1.3	147	12.7	20.0	2.2	18	12	94	49	0.57	0.4	0.8	A	178	11	0.6	271	15	0.4	53	71	1.6
12	20	13	50.7	61	4.8	147	7.2	20.0	1.9	22	15	75	43	0.63	0.3	0.8	A	291	4	0.4	200	7	0.6	50	82	1.5
12	20	21	30.1	60	59.9	147	15.7	18.6	3.0	24	12	83	52	0.52	0.4	0.7	A	178	5	0.6	269	10	0.4	62	79	1.4
12	20	29	15.3	61	3.8	147	2.8	17.9	2.5	23	11	74	39	0.52	0.4	0.7	A	292	6	0.5	201	13	0.6	46	76	1.4
12	20	33	46.4	60	59.3	147	12.3	9.5	1.8	20	16	83	50	0.70	0.3	0.5	A	177	9	0.6	269	13	0.4	53	74	1.0
12	20	43	28.8	61	1.2	147	10.0	15.0	1.7	21	14	80	47	0.49	0.3	0.8	A	275	5	0.4	185	6	0.6	45	82	1.5
12	20	46	3.9	60	59.7	147	15.4	18.5	1.8	21	15	84	52	0.41	0.4	0.9	A	282	6	0.5	191	12	0.7	38	77	1.8
12	21	0	17.1	60	59.6	147	14.5	15.2	1.9	22	15	83	52	0.52	0.3	0.7	A	182	6	0.6	273	7	0.4	52	81	1.2
12	21	21	1.9	61	2.1	147	8.6	13.9	1.5	14	10	91	45	0.58	0.4	0.9	A	189	2	0.7	279	5	0.4	77	85	1.6

1983 VALDEZ AREA EARTHQUAKES

1983		ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	DI KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
JUL	12	21	48	42.7	61	4.0	147	4.1	16.9	1.6	19	13	74	40	0.48	0.4	0.7	A	283	8	0.4	191	12	0.6	46	75	1.4
	12	21	50	8.1	61	0.7	147	11.5	16.2	1.6	19	14	81	48	0.52	0.4	0.9	A	280	10	0.4	188	15	0.7	43	72	1.8
	12	21	59	45.0	61	2.6	147	3.7	13.4	1.8	20	14	82	41	0.56	0.4	0.7	A	279	12	0.4	186	13	0.6	50	72	1.3
	12	22	6	46.9	61	0.4	147	12.7	17.4	1.7	16	11	95	50	0.48	0.4	0.8	A	270	7	0.4	179	8	0.7	41	79	1.6
	12	22	43	28.4	61	5.9	146	58.0	18.6	1.8	22	15	70	34	0.41	0.4	0.9	A	290	5	0.4	199	13	0.7	41	76	1.7
	12	23	9	35.3	61	4.4	147	1.0	15.1	1.5	16	12	85	38	0.49	0.4	1.0	A	274	3	0.4	183	4	0.7	40	85	1.9
	12	23	13	47.0	61	0.4	147	15.1	20.4	1.7	14	8	96	52	0.36	0.4	1.3	A	281	2	0.5	191	2	0.8	56	87	2.4
	12	23	38	12.6	61	2.2	147	9.6	15.1	1.7	21	15	78	46	0.54	0.4	0.9	A	279	6	0.5	188	13	0.7	33	76	1.7
	12	23	40	58.8	61	5.1	146	58.8	21.7	2.0	18	13	71	35	0.55	0.5	1.2	A	281	11	0.4	188	14	0.6	48	72	2.3
	13	1	26	55.0	61	4.4	147	2.7	18.5	2.1	20	5	73	39	0.45	0.4	1.0	A	304	6	0.5	213	12	0.6	60	77	2.0
	13	1	46	52.4	61	4.7	147	3.5	19.2	1.9	17	10	73	40	0.54	0.3	0.8	A	190	5	0.6	281	7	0.4	65	81	1.5
	13	1	57	38.9	61	4.0	147	2.2	17.0	2.4	19	12	74	39	0.44	0.4	1.0	A	307	1	0.5	217	6	0.7	46	84	1.9
	13	3	12	7.5	61	1.6	147	13.0	17.3	2.1	18	9	80	49	0.54	0.3	0.7	A	168	4	0.6	261	9	0.5	55	80	1.4
	13	3	50	7.4	61	3.4	147	13.4	16.6	3.1	19	7	78	49	1.06	0.5	1.1	A	172	10	0.8	265	12	0.5	44	74	2.1
	13	4	22	15.8	61	0.7	147	13.9	16.0	1.9	17	10	95	50	0.64	0.3	0.8	A	187	3	0.6	277	6	0.4	70	83	1.5
	13	4	43	4.8	61	1.2	147	6.7	10.5	2.6	19	10	78	44	0.45	0.5	0.7	A	261	12	0.5	166	12	0.8	34	72	1.4
	13	6	4	7.7	61	3.5	147	8.3	10.8	2.1	12	8	85	44	0.60	0.4	1.1	A	309	0	0.5	219	8	0.8	39	82	2.1
	13	7	45	16.4	61	0.1	147	16.3	16.7	2.3	19	9	83	53	0.42	0.3	0.8	A	188	6	0.6	279	8	0.5	62	80	1.6
	13	9	10	31.5	61	2.7	147	7.3	19.0	2.3	18	5	77	44	0.36	0.5	0.9	A	270	11	0.5	176	17	0.7	31	69	1.8
	13	10	2	13.4	61	3.7	147	2.5	20.6	2.0	17	6	86	39	0.39	0.4	1.2	A	176	7	0.7	268	12	0.5	56	76	2.3
	13	11	33	49.5	61	4.9	147	5.9	30.4	2.7	18	11	74	42	0.74	0.4	0.6	A	183	2	0.7	274	5	0.5	71	85	1.1
	13	11	36	26.8	61	39.6	147	51.9	29.8	2.2	19	9	112	30	0.60	0.5	0.6	A	90	15	0.5	191	38	0.8	342	48	1.2
	13	13	8	31.0	60	59.9	147	13.0	14.6	2.4	15	9	82	50	0.63	0.4	0.9	A	175	3	0.8	266	20	0.5	77	70	1.8
	13	14	2	42.5	61	3.1	147	2.9	17.3	2.2	20	11	75	40	0.49	0.3	0.7	A	273	8	0.4	182	8	0.5	48	79	1.4
	13	17	6	35.1	61	2.4	147	8.6	16.3	2.0	20	8	78	45	0.40	0.4	0.9	A	265	11	0.4	172	12	0.7	36	74	1.7
	13	17	49	54.1	60	59.4	147	10.5	11.6	2.0	18	7	82	48	0.49	0.4	0.7	A	261	6	0.5	167	8	0.6	26	79	1.4
	13	18	6	14.5	61	0.2	147	13.9	17.8	2.6	18	12	82	51	0.57	0.3	0.8	A	179	3	0.6	270	9	0.4	71	80	1.4
	13	18	54	49.8	61	1.6	147	4.9	14.0	1.9	18	11	77	42	0.49	0.4	0.7	A	167	14	0.6	262	19	0.4	43	66	1.5
	13	23	24	21.9	60	58.9	147	12.3	14.3	2.0	17	10	83	50	0.42	0.4	0.7	A	171	11	0.7	263	12	0.5	39	74	1.3
	14	0	57	43.6	61	0.3	147	13.4	18.8	2.3	18	18	82	50	0.50	0.3	0.7	A	180	6	0.6	271	8	0.4	54	80	1.4
	14	1	37	59.8	61	0.7	147	8.1	14.1	1.9	18	9	92	45	0.53	0.4	0.7	A	173	13	0.8	266	15	0.4	44	70	1.4
	14	1	44	22.5	61	1.9	147	12.6	18.6	2.0	20	11	80	49	0.65	0.3	0.8	A	178	5	0.6	269	8	0.4	56	81	1.4
	14	2	14	30.7	61	1.5	147	8.2	18.8	2.1	17	12	79	45	0.55	0.3	0.7	A	178	5	0.6	269	10	0.4	62	79	1.4
	14	3	43	10.6	61	2.4	147	5.2	19.7	2.0	17	8	89	42	0.49	0.4	0.8	A	177	10	0.6	269	13	0.4	50	74	1.5
	14	7	9	0.6	61	3.0	147	5.9	17.7	2.0	19	9	76	42	0.54	0.4	0.8	A	183	8	0.7	274	9	0.4	52	78	1.6
	14	7	10	53.7	61	0.5	147	13.1	21.2	1.9	20	12	82	50	0.44	0.4	0.9	A	185	9	0.6	277	10	0.4	54	76	1.7
	14	9	14	34.9	61	0.9	147	12.0	20.6	1.9	19	12	81	49	0.49	0.4	0.9	A	277	8	0.4	186	10	0.6	45	77	1.8
	14	11	36	5.1	61	1.9	147	11.5	16.1	2.2	18	11	79	48	0.46	0.3	0.8	A	178	7	0.6	269	8	0.4	47	79	1.5
	14	12	30	10.7	61	2.3	147	5.3	14.4	2.2	20	11	77	42	0.49	0.3	0.6	A	166	6	0.6	261	15	0.4	55	73	1.2
	14	13	2	9.3	61	4.4	146	29.7	14.2	1.9	19	9	68	11	0.60	0.4	0.6	A	261	19	0.5	161	19	0.8	31	62	1.1
	15	8	23	21.3	61	1.5	147	10.6	17.2	2.1	17	8	80	47	0.42	0.3	0.9	A	181	4	0.6	272	5	0.5	53	84	1.6
	15	19	8	56.3	60	58.4	147	13.2	7.7	1.6	6	3	146	62	0.21	0.7	3.6	C	81	2	0.7	166	2	1.4	304	84	6.7
	16	3	14	4.4	61	33.0	146	23.3	29.6	2.1	17	11	84	26	0.70	0.4	0.4	A	128	6	0.5	223	38	0.6	30	51	0.9
	16	5	37	51.0	61	2.4	147	12.9	20.2	1.8	17	14	88	18	0.52	0.3	0.6	A	21	1	0.6	290	4	0.4	125	86	1.2
	16	11	47	57.4	60	57.6	147	15.2	14.4	2.1	19	9	86	40	0.56	0.3	0.7	A	288	3	0.4	198	8	0.6	38	81	1.4
	16	13	48	10.5	61	6.4	146	51.8	17.5	1.9	18	16	78	18	0.60	0.3	0.6	A	209	3	0.5	299	7	0.4	96	82	1.2
	16	16	42	59.2	61	3.0	147	6.1	16.3	1.7	21	13	57	18	0.57	0.4	0.6	A	196	5	0.7	287	11	0.5	82	78	1.2
	16	17	45	43.0	61	0.6	147	15.8	21.7	1.9	19	15	83	17	0.58	0.3	0.6	A	16	2	0.6	285	8	0.4	120	82	1.1
	16	21	50	29.1	61	44.0	147	34.5	30.4	3.2	24	4	127	17	0.59	0.8	0.9	A	262	0	0.8	172	42	1.2	352	48	1.9
	16	22	19	36.8	61	4.8	147	0.4	17.1	1.9	18	16	54	21	0.57	0.3	0.6	A	8	0	0.6	278	12	0.4	98	78	1.2
	16	22	42	39.8	60	58.8	147	11.7	17.8	1.9	19	16	83	12	0.57	0.3	0.6	A	21	1	0.5	291	8	0.4	118	82	1.1

1983 VALDEZ AREA EARTHQUAKES

1983	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
JUL 17	13	12	30.6	61	0.7	147	12.6	24.1	2.5	20	14	80	15	0.43	0.3	0.6	A	218	4	0.6	309	10	0.4	107	79	1.1
17	14	48	22.5	61	0.7	147	13.0	22.4	1.7	21	15	81	16	0.48	0.3	0.6	A	201	3	0.6	291	11	0.4	96	79	1.1
17	14	52	22.0	61	6.7	146	55.0	21.2	2.4	20	12	35	20	0.43	0.3	0.7	A	8	4	0.6	278	9	0.4	122	80	1.4
17	23	1	31.6	61	4.2	147	2.0	16.7	1.6	21	13	46	20	0.62	0.3	0.8	A	6	2	0.6	276	7	0.4	112	83	1.4
18	11	30	58.5	60	59.9	147	17.5	18.6	1.9	19	17	84	17	0.62	0.3	0.5	A	189	4	0.6	280	14	0.4	83	75	1.0
18	12	8	13.9	61	0.5	147	13.3	22.0	1.8	18	15	82	15	0.56	0.3	0.6	A	204	4	0.6	294	11	0.4	94	78	1.1
18	13	42	10.6	61	0.3	147	11.3	16.6	1.8	19	15	78	14	0.53	0.3	0.7	A	193	4	0.6	284	14	0.4	87	75	1.3
18	15	20	1.6	61	0.6	147	12.6	23.4	2.1	18	11	81	15	0.43	0.3	0.7	A	11	3	0.6	280	19	0.5	110	71	1.3
18	19	26	44.0	60	59.4	147	17.7	17.4	2.7	20	13	85	16	0.46	0.3	0.7	A	300	6	0.4	209	10	0.6	61	78	1.4
19	5	51	36.4	61	5.3	146	57.3	16.9	2.1	18	15	36	22	0.56	0.3	0.6	A	21	1	0.5	291	10	0.4	117	80	1.2
19	5	58	50.4	61	1.0	147	15.8	18.0	1.7	18	14	95	17	0.64	0.3	0.6	A	204	6	0.6	294	7	0.4	73	81	1.2
19	8	47	26.0	61	1.0	147	12.7	27.2	2.1	19	14	80	16	0.62	0.3	0.5	A	275	8	0.4	7	11	0.6	150	76	0.9
20	1	29	50.4	61	1.9	147	8.2	17.7	2.2	19	13	77	16	0.42	0.3	0.6	A	40	0	0.5	310	6	0.4	130	84	1.1
20	5	47	29.6	61	29.1	146	38.3	26.1	2.0	19	6	69	38	0.68	0.4	0.8	A	289	3	0.5	199	3	0.7	64	86	1.6
20	14	13	5.8	60	42.1	147	29.2	31.3	2.5	26	6	117	50	0.68	0.4	0.5	A	114	10	0.6	22	11	0.8	245	75	0.9
20	20	11	31.8	60	59.9	147	15.7	18.4	3.1	19	4	83	34	0.39	0.5	0.9	A	271	11	0.6	179	12	0.9	43	74	1.8
21	10	25	19.0	61	1.1	147	9.1	15.2	2.1	18	16	69	15	0.68	0.3	0.5	A	211	5	0.6	302	6	0.4	82	82	0.9
21	15	43	52.3	61	2.1	147	6.3	15.2	2.2	19	15	58	16	0.67	0.3	0.6	A	194	4	0.5	284	5	0.4	65	84	1.1
21	23	26	13.9	61	3.9	147	1.5	11.3	1.7	16	14	61	20	0.80	0.3	0.6	A	197	1	0.6	287	5	0.4	96	85	1.2
22	6	2	5.0	61	5.2	146	59.4	16.3	2.8	21	7	75	36	0.61	0.4	0.8	A	295	2	0.4	205	5	0.7	47	85	1.5
22	12	50	19.6	61	3.3	147	9.6	28.0	2.9	21	9	65	19	0.58	0.4	0.5	A	296	5	0.5	28	17	0.7	190	72	0.9
23	4	34	1.1	61	2.9	147	7.1	20.8	1.8	21	14	60	18	0.61	0.4	0.6	A	298	5	0.4	28	9	0.7	179	80	1.1
23	13	13	49.5	60	47.2	146	54.3	13.8	2.2	21	6	129	49	0.53	0.5	0.8	A	285	7	0.5	193	15	0.8	39	73	1.6
24	14	47	46.5	61	5.0	146	59.3	21.8	2.4	20	12	40	22	0.63	0.3	0.7	A	21	1	0.6	291	3	0.4	129	87	1.3
26	11	16	5.0	61	1.2	147	10.4	21.7	2.3	21	7	80	37	0.48	0.3	0.9	A	274	0	0.5	184	5	0.6	4	85	1.7
26	17	58	50.6	61	19.6	145	3.7	35.8	2.0	15	7	112	47	0.51	0.5	0.6	A	100	5	0.6	8	24	0.9	201	65	1.2
27	4	1	0.8	60	28.9	145	3.8	21.7	1.4A	7	5	173	60	0.61	1.0	1.2	A	91	25	0.9	196	28	1.2	326	51	2.8
28	8	34	8.5	61	28.5	146	38.2	21.2	2.2	20	12	68	38	0.70	0.4	0.8	A	300	0	0.5	210	2	0.7	30	88	1.5
28	16	51	26.6	60	52.3	146	53.5	16.1	2.3	24	8	82	42	0.59	0.4	1.0	A	295	3	0.5	204	16	0.7	35	74	1.9
29	6	58	10.6	61	0.9	147	12.3	14.8	2.2	13	4	94	36	0.42	0.5	1.1	A	176	5	0.9	267	9	0.6	57	80	2.1
29	8	4	10.7	61	4.3	147	2.8	19.2	2.2	15	8	86	39	0.41	0.4	1.0	A	296	7	0.5	205	12	0.6	56	76	1.8
31	0	5	33.8	61	49.3	146	43.3	29.7	3.1	19	5	129	32	0.61	0.7	0.7	A	97	8	0.9	193	39	1.1	357	50	1.5
31	2	9	1.6	61	3.2	147	10.5	27.5	2.2	17	10	78	35	0.67	0.4	0.8	A	290	2	0.5	200	6	0.7	38	84	1.5
31	20	13	0.1	61	6.3	146	59.2	21.6	2.1	14	7	82	35	0.55	0.5	1.3	A	290	1	0.6	200	6	0.9	29	84	2.5
AUG 1	1	13	13.7	61	0.6	147	14.3	18.3	2.5	17	10	82	34	0.54	0.3	0.7	A	300	1	0.4	209	7	0.6	38	83	1.3
1	9	13	2.5	61	2.3	147	5.1	10.3	2.7	20	8	66	40	0.61	0.3	0.8	A	296	0	0.4	206	3	0.6	26	87	1.4
4	4	7	19.9	60	59.1	147	14.5	21.7	3.2	19	2	84	36	0.44	0.5	1.2	A	302	5	0.6	212	5	0.9	77	83	2.3
	4.4 MB 3.6 MS									FELT AT VALDEZ AND PALMER.																
4	7	56	44.5	60	58.8	147	14.6	16.0	2.1	12	8	84	36	0.42	0.6	1.1	A	294	5	0.7	202	15	1.0	42	74	2.0
4	8	1	57.1	60	58.6	147	15.7	16.0	2.4	13	8	85	36	0.38	0.5	0.9	A	306	1	0.6	216	9	0.8	42	81	1.8
4	13	48	29.4	61	2.8	147	5.7	16.2	1.9	11	6	89	39	0.34	0.4	1.0	A	298	3	0.6	208	6	0.8	55	83	2.0
4	15	30	0.9	60	59.6	147	17.5	14.8	1.9	12	7	98	33	1.04	0.8	0.9	A	314	7	0.6	261	30	0.9	55	43	1.6
4	17	16	55.7	60	58.6	147	17.0	15.6	2.9	13	4	85	35	0.38	0.6	1.2	A	291	5	0.7	200	14	1.0	40	75	2.4
5	0	25	21.8	60	37.2	145	25.8	11.0	1.9	17	6	101	16	0.55	0.6	0.8	A	344	11	1.0	81	32	0.6	237	56	1.8
5	0	27	57.8	60	36.4	145	28.5	12.2	1.4	8	3	104	17	0.36	1.0	1.0	A	288	4	0.9	22	44	1.2	194	46	2.4
5	21	23	38.7	61	43.7	147	28.1	35.1	3.7	21	0	111	14	0.48	1.0	0.9	A	262	7	0.9	358	39	2.3	164	50	1.1
	4.2 MB									FELT (IV) AT COPPER CENTER AND SUTTON. FELT WIDELY IN SOUTH CENTRAL ALASKA INCLUDING TALKEETNA, PALMER, AND ANCHORAGE.																
7	9	13	9.5	61	46.1	146	52.4	22.6	2.3	13	7	127	53	0.72	0.6	1.4	B	312	2	1.0	222	11	0.7	52	79	2.7
8	22	32	49.3	61	0.6	147	6.0	9.5	2.0	17	8	108	41	0.41	0.5	0.6	A	271	4	0.6	179	33	0.9	7	57	1.1
9	13	35	5.7	61	2.6	147	7.4	14.5	2.8	21	10	66	38	0.59	0.4	0.6	A	289	3	0.4	199	11	0.7	34	79	1.1

1983 VALDEZ AREA EARTHQUAKES

1983	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
AUG 11	16	19	12.1	60	40.1	144	36.2	35.6	2.4	20	8	73	33	0.59	0.4	0.4	A	6	15	0.7	269	23	0.6	126	62	0.8
11	23	29	5.0	61	30.6	147	20.5	15.8	2.0	19	7	58	36	0.44	0.4	1.0	A	184	2	0.8	274	5	0.6	72	85	1.8
16	19	37	56.0	60	59.1	147	14.1	14.1	2.1	20	12	112	36	0.54	0.5	0.8	A	264	10	0.5	170	19	0.8	20	68	1.5
17	7	48	54.7	60	30.0	144	55.3	18.0	1.2A	9	6	171	16	0.46	1.0	0.9	A	192	28	1.1	81	36	0.7	310	42	2.4
17	23	51	4.6	60	27.4	145	6.0	35.2	1.2A	4	2	229	11	0.35	6.8	0.9	D	198	2	12.8	289	29	2.3	104	61	1.2
21	1	3	47.3	61	34.8	146	28.0	30.2	2.2	17	10	80	31	0.75	0.4	0.5	A	268	1	0.6	177	26	0.6	0	64	1.1
21	10	49	34.9	60	30.5	144	52.8	29.0	1.6A	6	6	186	18	0.40	2.5	2.6	B	354	27	1.8	102	31	0.9	231	47	6.6
23	0	42	28.3	60	59.4	147	14.6	15.3	2.2	21	16	111	36	0.46	0.4	0.8	A	263	3	0.5	172	11	0.7	8	79	1.6
23	23	31	29.9	60	32.9	145	14.2	12.5	1.1	8	4	133	2	0.52	1.0	0.5	A	182	16	1.9	81	42	0.7	288	45	1.1
24	16	57	36.4	60	38.3	145	3.5	24.8	1.2A	8	4	116	14	0.24	1.1	0.9	A	142	13	2.2	44	31	0.9	252	56	1.9
25	2	58	56.6	61	42.0	146	33.8	29.3	2.4	18	7	94	41	0.77	0.6	0.6	A	261	17	0.7	136	34	0.6	7	40	1.3
26	22	22	25.6	61	0.8	147	5.1	10.7	2.7	23	8	67	41	0.61	0.6	0.9	A	273	7	0.5	180	19	0.9	22	70	1.7
28	17	40	5.2	61	20.1	146	34.5	27.1	1.9	17	6	87	26	0.60	0.4	0.7	A	297	4	0.5	207	6	0.8	61	83	1.4
28	21	42	43.1	60	20.1	146	40.1	16.5	2.0	17	6	108	56	0.41	0.7	1.1	A	264	10	0.8	170	21	1.0	18	67	2.2
SEP 5	22	51	31.6	61	8.7	144	52.4	32.3	1.3	8	7	114	25	0.46	0.5	1.2	A	89	12	0.6	356	12	0.8	223	73	2.3
7	19	22	5.0	60	58.7	147	18.9	30.2	6.2S	10	0	145	33	0.12	0.9	1.1	A	98	13	0.9	5	14	1.6	229	71	2.1
	6.2 MB 6.2 MS									SLIGHT DAMAGE (VI) AT VALDEZ. FELT (V) AT ANCHORAGE, CHUGIAK, COPPER CENTER, COOPER LANDING, HOMER, MOOSE PASS, PALMER, SOLDOTNA, SUTTON, WASILLA AND WILLOW.																
7	19	27	15.2	60	56.5	147	15.4	15.4	3.4A	13	7	130	38	0.31	0.7	1.2	A	275	7	0.6	181	23	1.0	21	66	2.5
7	19	28	57.9	61	1.1	147	16.2	28.7	3.0A	14	7	122	33	0.61	0.7	1.0	A	270	5	0.6	177	26	1.2	10	63	1.9
7	19	29	47.9	61	1.6	147	16.4	29.8	3.9A	11	6	132	32	0.43	1.0	1.2	A	266	8	0.6	171	34	1.4	8	55	2.5
7	19	29	16.1	60	59.2	147	13.1	28.4	3.5A	7	7	133	37	0.60	0.7	0.8	A	269	5	0.6	176	33	1.2	7	57	1.7
7	19	34	56.3	60	58.1	147	16.5	26.6	2.5A	11	10	127	36	0.60	0.6	0.9	A	87	10	0.6	182	23	1.0	335	65	1.8
7	19	35	49.3	60	59.5	147	17.2	30.6	2.4A	13	10	125	34	0.42	0.5	0.6	A	94	9	0.5	192	37	0.7	353	51	1.3
7	19	36	8.7	61	0.7	147	14.0	28.5	2.8A	12	8	122	35	0.41	0.5	1.0	A	278	0	0.5	188	12	0.8	8	78	1.9
7	19	36	24.7	60	57.9	147	15.0	18.0	2.9A	9	8	127	37	0.49	0.7	1.1	A	96	1	0.6	187	24	0.9	4	66	2.2
7	19	39	43.5	60	60.0	147	16.6	30.0	2.8A	11	8	124	33	0.47	0.6	0.8	A	94	6	0.5	187	27	0.9	352	62	1.5
7	19	39	9.7	61	1.2	147	14.3	30.1	2.1A	11	7	121	34	0.39	0.6	0.7	A	94	10	0.5	191	36	0.9	351	52	1.6
7	19	40	7.6	60	56.9	147	16.4	14.4	3.0A	10	9	129	37	0.42	0.7	0.9	A	266	6	0.5	173	28	1.0	7	61	1.9
7	19	41	9.5	60	58.5	147	21.6	28.8	1.9	9	8	127	32	0.42	0.7	0.8	A	103	11	0.5	201	33	1.0	357	55	1.7
7	19	42	6.5	60	58.5	147	17.7	29.8	2.2	9	8	126	34	0.69	0.5	0.8	A	196	9	1.0	104	14	0.5	318	73	1.6
7	19	47	57.2	61	1.0	147	16.2	30.2	1.9	11	9	122	33	0.32	0.5	0.8	A	100	6	0.5	192	16	0.9	350	73	1.6
7	19	48	28.4	61	0.3	147	13.1	29.9	2.5	11	6	123	36	0.23	0.8	1.1	A	101	1	0.6	191	25	1.3	9	65	2.2
7	19	49	45.5	61	0.1	147	16.3	28.2	2.3A	11	7	123	33	0.27	0.7	1.3	A	100	9	0.8	192	12	1.2	334	75	2.4
7	19	50	0.9	61	1.6	147	14.5	34.4	2.2A	8	7	132	33	0.13	1.3	1.0	B	96	7	0.9	2	31	2.8	197	58	1.4
7	19	54	31.9	60	59.4	147	12.5	28.8	2.7	11	7	124	37	0.37	0.7	1.1	A	115	3	0.8	205	14	1.3	13	76	2.2
7	19	56	33.1	60	57.5	147	17.7	28.0	2.0	11	8	128	36	0.44	0.7	1.3	B	108	8	0.7	200	15	1.3	351	73	2.6
7	19	59	45.2	60	59.5	147	15.4	26.5	2.1	12	7	125	35	0.49	0.7	1.1	A	83	6	0.6	175	19	1.1	336	70	2.2
7	20	3	20.0	60	59.8	147	17.3	19.0	2.4	13	7	124	54	0.36	0.5	1.0	A	261	9	0.5	169	11	0.8	29	76	1.9
7	20	6	20.3	60	58.4	147	15.1	16.0	1.9	13	5	126	36	0.22	0.8	1.4	A	137	7	0.8	261	18	0.7	32	51	2.5
7	20	6	53.0	60	59.1	147	16.2	27.9	2.1	13	7	125	35	0.38	0.6	1.1	A	112	2	0.8	203	11	1.0	12	79	2.0
7	20	11	44.6	61	1.2	147	17.9	28.3	2.0	13	9	122	31	0.36	0.6	1.6	B	266	2	0.7	176	9	1.0	8	81	3.1
7	20	18	36.6	61	0.5	147	14.2	27.0	2.5	13	7	123	35	0.38	0.5	1.2	A	275	0	0.6	185	13	0.9	5	77	2.4
7	20	25	16.2	61	1.7	147	17.1	30.2	2.2	11	7	121	31	0.49	0.8	0.6	A	108	17	0.6	261	42	0.9	11	19	1.4
7	20	27	56.2	60	59.9	147	16.1	19.5	2.1	12	8	124	34	0.50	0.6	1.4	B	286	3	0.6	195	15	0.9	27	75	2.7
7	20	34	10.5	60	59.8	147	13.1	22.5	2.2	12	8	124	36	0.23	0.6	1.4	B	287	1	0.6	197	17	0.9	20	73	2.8
7	20	40	55.1	61	2.4	147	13.9	32.0	2.2	12	7	119	33	0.52	0.6	0.7	A	113	8	0.5	209	35	0.9	12	54	1.4
7	20	44	15.6	60	59.1	147	14.2	18.7	2.2	14	8	125	36	0.33	0.5	1.0	A	278	6	0.5	187	15	0.8	29	74	2.0
7	20	48	27.0	60	57.1	147	15.3	13.0	2.2	13	7	129	38	0.43	0.6	1.1	A	158	10	0.9	261	11	0.7	32	70	2.1
7	20	51	10.8	61	0.1	147	17.0	26.9	2.2	13	9	124	33	0.48	0.4	0.9	A	86	7	0.5	177	11	0.7	324	77	1.7

1983 VALDEZ AREA EARTHQUAKES

1983	ORIGIN TIME	HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
SEP	7	20	56	49.7	60	59.3	147	16.4	17.3	2.2	13	9	133	34	0.42	0.4	1.3	A	276	1	0.6	186	4	0.8	20	86	2.4
	7	21	9	12.4	60	59.8	147	13.7	29.3	2.5	13	8	132	36	0.54	0.5	0.6	A	105	4	0.5	196	11	0.9	355	78	1.2
	7	21	13	35.8	60	58.7	147	20.0	27.0	2.6	13	8	135	33	0.43	0.6	1.1	A	107	2	0.6	197	4	1.1	350	86	2.0
	7	21	18	11.9	60	58.5	147	15.2	18.8	2.5	13	6	134	36	0.35	0.5	1.1	A	275	0	0.5	185	5	0.9	5	85	2.0
	7	21	20	36.9	60	59.5	147	20.4	32.1	1.9	11	8	142	31	0.24	0.5	0.5	A	261	5	0.5	353	39	1.0	165	51	0.8
	7	21	21	13.8	61	3.0	147	17.2	30.6	2.2	10	3	134	30	1.32	0.9	1.1	A	269	6	0.8	177	19	1.6	16	70	2.1
	7	21	22	43.4	60	57.4	147	19.9	25.4	2.2	11	5	148	35	0.16	0.6	1.3	A	99	6	0.6	190	9	1.1	336	79	2.5
	7	21	32	48.7	60	58.5	147	15.3	22.6	2.4	11	6	145	36	0.26	0.5	2.1	B	172	2	0.9	82	4	0.6	289	86	4.0
	7	21	36	21.5	60	59.4	147	20.5	31.5	3.2	11	1	143	31	0.19	0.8	0.7	A	81	21	0.7	330	41	1.5	191	41	1.3
	7	21	57	29.7	60	58.3	147	16.5	22.9	2.4	12	7	133	35	0.33	0.5	1.6	B	261	0	0.5	343	0	0.9	0	90	2.9
	7	22	1	50.7	60	57.1	147	17.5	26.4	2.2	12	8	135	36	0.27	0.5	0.8	A	186	5	1.0	95	11	0.5	300	78	1.6
	7	22	14	40.1	61	1.0	147	18.1	29.9	2.1	10	8	139	31	0.29	0.6	0.8	A	89	4	0.5	179	11	1.1	339	78	1.6
	7	22	22	10.6	61	0.6	147	18.4	27.2	4.0	14	1	123	31	0.34	0.6	1.2	A	107	6	0.7	198	9	1.1	344	79	2.3
				5.0 MB							FELT AT ANCHORAGE, PALMER, VALDEZ, AND WASILLA.																
	7	22	28	27.6	61	0.8	147	21.7	28.5	2.8	12	7	129	29	0.28	0.4	0.6	A	344	4	0.8	81	7	0.5	226	79	1.2
	7	22	41	18.4	60	59.3	147	18.5	23.9	2.4	11	4	132	33	0.46	0.8	2.3	B	88	2	0.7	178	11	1.3	348	79	4.3
	7	23	1	47.9	60	60.0	147	13.1	27.7	2.3	13	9	123	36	0.39	0.5	0.8	A	97	4	0.5	189	22	0.9	357	68	1.6
	7	23	9	20.7	60	57.5	147	22.0	27.4	2.2	11	8	148	33	0.17	0.6	0.8	A	85	9	0.5	177	14	1.2	323	73	1.6
	7	23	45	13.5	60	56.7	147	19.8	23.0	2.4	11	6	150	36	0.18	0.5	2.0	B	97	4	0.6	187	4	0.9	322	84	3.8
	8	0	21	46.5	60	59.8	147	14.9	28.8	2.4	13	8	132	35	0.38	0.4	0.6	A	94	11	0.5	187	14	0.8	327	72	1.1
	8	0	39	29.8	60	59.0	147	18.0	29.5	2.8	13	7	134	34	0.35	0.5	0.6	A	95	11	0.5	188	12	0.9	324	74	1.2
	8	1	49	57.6	60	59.5	147	14.3	17.2	2.3	13	9	132	36	0.36	0.4	0.9	A	269	5	0.4	179	8	0.7	31	81	1.6
	8	2	1	59.0	61	0.5	147	18.5	28.9	2.1	13	9	132	32	0.50	0.5	0.6	A	106	7	0.5	199	23	0.9	0	66	1.1
	8	2	23	24.8	60	57.0	147	15.6	13.7	2.9	13	6	137	38	0.36	0.6	1.3	A	280	2	0.5	190	9	1.0	22	81	2.4
	8	2	51	23.3	61	0.5	147	14.8	27.3	3.3	13	5	131	34	0.42	0.6	0.9	A	101	1	0.6	191	21	1.1	8	69	1.7
	8	2	57	28.3	60	57.0	147	15.8	16.7	2.5	13	7	137	38	0.36	0.4	1.1	A	270	1	0.5	179	8	0.8	7	82	2.0
	8	3	8	14.0	60	58.1	147	15.0	16.1	1.9	13	10	135	37	0.46	0.4	1.0	A	284	1	0.5	194	9	0.8	20	81	1.8
	8	3	20	31.6	60	56.3	147	18.4	14.2	2.2	13	7	138	37	0.40	0.5	0.7	A	270	5	0.5	178	18	0.9	15	71	1.3
	8	3	21	25.5	60	58.7	147	22.0	27.3	3.0	13	6	135	31	0.44	0.5	0.8	A	103	3	0.6	193	7	1.0	350	82	1.5
	8	3	45	23.6	60	59.3	147	15.4	28.7	2.8	13	8	133	35	0.59	0.5	0.6	A	204	5	0.9	113	8	0.5	326	81	1.2
	8	4	20	23.7	60	57.8	147	13.1	12.9	2.2	13	7	135	39	0.35	0.5	1.2	A	270	1	0.5	180	6	0.9	9	84	2.2
	8	4	52	3.3	61	0.7	147	15.1	28.3	2.4	13	6	131	34	0.48	0.6	0.9	A	94	7	0.6	186	17	1.0	342	72	1.6
	8	5	11	42.3	60	59.0	147	19.4	27.4	2.0	13	8	126	33	0.45	0.4	0.6	A	101	7	0.5	194	19	0.8	352	70	1.2
	8	5	21	11.7	60	57.1	147	16.6	15.0	2.1	14	6	129	37	0.40	0.5	0.8	A	261	10	0.4	165	11	1.0	30	74	1.6
	8	5	22	1.5	60	57.7	147	14.9	12.9	1.9	12	10	128	37	0.47	0.5	0.9	A	269	9	0.5	177	13	0.9	33	74	1.7
	8	5	30	46.4	60	59.4	147	18.8	25.7	2.5	14	8	125	33	0.40	0.5	1.3	A	205	2	0.9	115	4	0.5	322	86	2.4
	8	6	22	19.8	61	1.0	147	15.3	27.6	2.0	14	12	122	33	0.51	0.5	0.9	A	105	2	0.5	195	6	0.8	357	84	1.8
	8	6	37	18.1	60	56.7	147	13.7	14.4	2.2	12	7	129	39	0.39	0.6	0.7	A	278	7	0.5	183	33	0.8	18	56	1.5
	8	7	5	50.0	60	58.5	147	21.9	28.1	2.1	14	9	127	32	0.43	0.6	0.8	A	106	6	0.6	198	20	0.9	0	69	1.6
	8	7	55	19.3	60	59.8	147	14.1	27.9	2.2	13	8	124	35	0.40	0.4	0.7	A	87	7	0.5	179	18	0.7	337	71	1.3
	8	8	23	22.8	60	57.6	147	15.5	29.8	3.3	14	5	128	37	0.47	0.6	0.8	A	96	6	0.7	187	7	1.1	326	81	1.6
	8	8	40	24.4	60	57.7	147	11.7	15.1	1.2	13	7	127	39	0.44	0.5	1.0	A	277	1	0.4	187	12	0.8	12	78	2.0
	8	9	45	50.1	61	1.2	147	12.4	28.9	2.9	14	3	121	35	0.34	0.7	0.9	A	276	9	0.8	183	19	1.3	30	69	1.7
	8	11	18	36.6	60	58.5	147	14.0	29.5	2.2	14	7	126	37	0.63	0.5	0.7	A	91	2	0.5	182	26	0.9	357	64	1.4
	8	14	51	27.4	60	58.9	147	14.8	30.9	2.4	14	7	125	36	0.33	0.5	0.8	A	96	2	0.5	187	23	0.9	1	67	1.5
	8	15	50	7.1	60	58.4	147	15.6	29.9	2.8	14	7	126	36	0.42	0.5	0.6	A	98	11	0.5	192	19	0.9	340	68	1.1
	8	15	57	40.7	60	59.7	147	15.9	27.7	2.6	14	7	124	34	0.45	0.5	0.8	A	92	2	0.5	183	16	0.9	355	74	1.6
	8	17	46	48.6	60	59.3	147	21.6	26.4	2.2	12	8	125	31	0.44	0.4	1.0	A	97	5	0.5	187	5	0.8	322	83	1.8
	8	21	31	53.9	60	57.6	147	19.1	20.1	2.3	14	5	128	35	0.34	0.5	1.0	A	88	1	0.5	178	13	0.9	354	77	2.0
	9	3	17	22.0	60	56.9	147	18.5	18.0	2.5	15	9	129	36	0.56	0.4	0.8	A	278	3	0.4	187	19	0.7	17	71	1.6
	9	4	5	35.0	60	58.5	147	16.3	19.0	2.2	17	13	113	35	0.72	0.4	0.6	A	271	6	0.4	178	24	0.7	14	65	1.2

1983 VALDEZ AREA EARTHQUAKES

1983	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
SEP 9	4	19	52.6	60	59.7	147	13.1	21.5	2.2	17	8	111	36	0.43	0.4	0.9	A	284	1	0.4	194	14	0.7	18	76	1.8
9	5	13	43.5	60	58.0	147	16.2	15.7	3.0	15	7	121	36	0.53	0.6	1.0	A	282	3	0.5	191	20	0.9	20	70	1.9
9	5	54	51.8	60	55.9	147	17.5	14.8	2.2	14	11	131	38	0.84	0.4	0.8	A	279	0	0.4	189	14	0.7	9	76	1.5
9	7	24	32.4	61	0.1	147	14.1	26.9	2.7	14	8	123	35	0.48	0.4	0.8	A	104	3	0.4	194	5	0.8	343	84	1.5
9	8	48	33.2	60	57.3	147	15.1	20.7	2.0	14	9	128	38	0.43	0.5	1.0	A	274	3	0.5	183	20	0.8	12	70	2.0
9	9	14	33.1	60	56.7	147	18.5	18.0	3.0	14	4	130	36	0.36	0.7	1.1	A	279	2	0.6	188	24	0.9	13	66	2.1
9	11	52	13.2	60	57.8	147	15.9	17.9	2.1	14	9	127	36	0.49	0.5	0.9	A	280	1	0.5	190	19	0.8	13	71	1.8
9	13	29	50.4	60	59.3	147	16.7	26.7	2.1	14	11	125	34	0.54	0.4	0.7	A	101	6	0.5	192	15	0.7	350	74	1.3
9	18	20	55.4	60	58.8	147	14.2	30.4	2.2	14	10	125	36	0.60	0.5	0.6	A	90	4	0.4	182	28	0.8	353	62	1.2
9	21	29	56.9	61	0.2	147	16.8	25.9	2.2	16	11	58	33	0.63	0.3	0.9	A	195	2	0.6	105	3	0.4	319	86	1.6
9	23	27	24.9	60	58.2	147	15.6	30.4	2.7	17	10	67	36	0.43	0.3	0.7	A	33	1	0.5	123	6	0.4	294	84	1.3
10	2	31	8.4	60	59.2	147	14.0	21.6	2.4	17	10	97	36	0.47	0.4	0.9	A	280	0	0.4	190	11	0.7	10	79	1.6
10	3	14	45.3	60	58.2	147	16.5	30.1	2.4	17	5	60	36	0.40	0.4	0.9	A	299	4	0.6	208	5	0.7	67	84	1.7
10	9	4	7.6	60	57.3	147	19.3	26.0	2.4	19	9	61	35	0.72	0.3	0.8	A	115	4	0.5	205	5	0.6	346	84	1.6
10	9	12	39.0	60	58.1	147	14.3	30.5	3.5	17	3	59	37	0.39	0.5	0.9	A	296	0	0.7	26	3	0.9	206	87	1.7
10	16	51	42.3	60	57.6	147	14.1	19.1	1.9	16	9	107	38	0.58	0.5	0.9	A	91	1	0.5	181	3	0.9	343	87	1.7
10	19	3	48.0	61	0.1	147	13.2	23.3	2.3	15	9	58	36	0.38	0.4	0.8	A	293	2	0.4	203	10	0.6	34	80	1.6
10	23	22	6.8	60	57.8	147	16.0	17.9	1.9	15	8	68	36	0.53	0.4	1.1	A	25	1	0.8	115	3	0.5	277	87	2.1
10	23	29	34.7	60	59.3	147	14.0	23.0	2.4	17	7	52	36	0.42	0.4	1.2	A	304	0	0.5	214	4	0.7	34	86	2.2
11	1	30	6.9	61	0.0	147	16.1	28.4	2.6	17	8	67	34	0.45	0.4	0.8	A	302	1	0.5	32	7	0.8	204	83	1.6
11	5	9	59.4	60	28.8	145	5.0	18.3	1.6	9	4	198	9	0.40	1.4	0.6	A	314	25	1.6	261	39	1.2	79	34	0.8
11	6	48	23.0	61	3.0	147	2.1	16.2	2.1	18	7	62	39	0.55	0.4	1.0	A	97	1	0.4	187	5	0.7	356	85	1.8
11	12	17	44.0	61	0.8	147	16.0	30.0	2.3	18	10	58	33	0.65	0.4	0.6	A	28	1	0.7	118	7	0.4	290	83	1.1
11	14	17	20.9	60	58.1	147	15.5	20.6	2.6	19	8	59	36	0.42	0.5	1.3	A	139	1	0.5	261	4	0.7	38	58	2.1
11	15	31	42.6	60	53.5	144	32.4	15.4	1.0	6	3	203	9	0.33	1.2	1.0	A	183	21	2.0	291	39	2.5	72	44	1.1
11	22	58	32.0	60	58.6	147	14.8	31.4	2.8	16	6	67	36	0.36	0.4	0.6	A	107	1	0.6	198	9	0.8	11	81	1.1
12	3	18	26.8	60	58.2	147	20.1	29.4	2.5	18	8	69	17	0.42	0.3	0.5	A	311	4	0.5	41	4	0.6	176	84	1.0
12	3	33	43.1	60	58.6	147	15.2	32.4	1.8	18	10	71	14	0.49	0.4	0.4	A	282	10	0.5	185	34	0.7	26	54	0.9
12	3	49	39.0	60	25.8	144	54.6	20.0	1.7	15	6	114	20	0.52	0.6	0.9	A	27	16	0.9	125	26	0.8	269	59	1.9
12	5	23	3.2	60	27.4	145	3.3	26.8	0.7A	6	3	251	12	0.45	3.0	1.0	B	306	23	3.4	261	33	1.9	77	33	1.2
12	6	8	48.9	60	16.6	144	43.7	0.9	1.2A	8	5	232	39	0.59	1.4	1.5	B	206	16	2.5	106	31	1.2	319	54	3.2
12	6	52	35.6	60	58.7	147	15.2	24.4	2.0	18	10	67	14	0.49	0.4	0.6	A	301	1	0.4	31	4	0.7	197	86	1.2
12	7	31	26.6	61	0.8	147	15.8	28.1	1.8	18	13	68	17	0.63	0.4	0.5	A	283	1	0.4	13	9	0.7	187	81	1.0
12	7	39	47.3	60	25.3	145	0.6	25.3	1.1A	7	6	255	17	0.51	1.3	1.0	B	188	15	2.4	288	33	2.7	77	53	1.2
12	7	53	4.7	60	25.5	145	1.7	27.7	0.6A	4	4	257	16	0.51	1.9	1.2	B	312	23	3.7	209	29	2.9	74	52	1.4
12	11	46	10.7	60	59.8	147	15.8	28.1	2.4	18	10	67	16	0.47	0.4	0.5	A	120	2	0.4	30	14	0.6	218	76	1.0
12	14	28	20.9	60	58.7	147	16.1	23.6	2.7	18	10	67	14	0.71	0.4	0.7	A	109	1	0.4	199	2	0.7	352	88	1.4
12	16	46	16.8	60	58.2	147	21.5	25.5	1.6	17	10	73	18	0.50	0.4	0.7	A	284	1	0.5	15	9	0.7	188	81	1.2
12	19	50	1.0	60	59.6	147	16.7	30.0	2.2	19	12	59	16	0.45	0.3	0.5	A	291	0	0.4	21	2	0.5	201	88	0.9
13	0	42	9.0	60	59.7	146	58.1	23.4	1.7	17	11	56	13	0.45	0.3	0.6	A	13	0	0.6	283	6	0.4	103	84	1.1
13	2	11	8.3	60	58.7	147	16.4	29.3	2.2	22	10	53	15	0.63	0.3	0.6	A	280	0	0.5	10	6	0.6	190	84	1.0
13	2	25	27.1	60	57.8	147	16.0	17.0	2.5	26	11	46	13	0.51	0.3	0.7	A	200	5	0.5	290	6	0.4	70	82	1.3
13	5	34	45.7	60	57.1	147	17.8	27.8	1.6	18	8	61	14	0.55	0.5	0.6	A	185	1	0.9	275	2	0.5	68	88	1.0
13	9	24	26.3	61	0.1	147	15.6	18.2	2.8	23	8	45	16	0.57	0.4	0.8	A	199	4	0.6	289	7	0.5	79	82	1.5
13	10	49	4.5	60	58.0	147	16.1	22.2	2.7	23	10	46	14	0.52	0.3	0.6	A	203	5	0.6	294	9	0.4	84	80	1.1
13	11	50	1.2	60	59.3	147	13.9	20.6	1.7	18	9	58	14	0.48	0.3	0.7	A	22	1	0.6	292	10	0.5	118	80	1.3
13	18	37	46.8	61	0.0	147	18.4	28.0	1.9	18	8	59	18	0.33	0.4	0.7	A	195	3	0.8	105	6	0.5	312	83	1.4
13	21	59	46.1	60	59.0	147	15.1	21.3	1.8	18	10	59	14	0.42	0.4	0.8	A	292	0	0.5	202	5	0.8	22	85	1.6
14	0	0	38.6	60	58.5	147	14.4	20.3	1.8	19	9	53	13	0.40	0.4	1.0	A	269	2	0.5	178	5	0.7	21	85	1.8
14	1	37	35.3	60	59.9	147	15.2	27.1	1.7	18	9	58	15	0.48	0.4	0.6	A	281	0	0.4	11	7	0.7	191	83	1.1
14	2	35	10.8	60	57.6	147	15.0	30.2	3.7	20	3	60	12	0.36	0.5	0.6	A	115	7	0.6	24	13	0.9	233	75	1.2

1983 VALDEZ AREA EARTHQUAKES

1983	DAY	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	DI KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
SEP	14	3	7	59.3	60	58.9	147	14.8	22.6	1.7	16	9	108	14	0.53	0.4	0.6	A	8	9	0.8	277	10	0.5	139	77	1.2
	14	3	40	6.4	61	0.2	147	16.3	30.3	2.1	19	10	58	17	0.48	0.4	0.5	A	112	3	0.4	20	26	0.7	208	64	1.0
	14	12	45	5.5	60	57.4	147	19.5	20.1	1.7	18	11	61	16	0.66	0.4	0.7	A	194	3	0.8	284	9	0.4	86	81	1.3
	14	16	3	53.3	60	59.4	147	15.3	34.5	2.2	19	10	59	15	0.56	0.3	0.3	A	275	17	0.5	170	40	0.6	23	45	0.7
	14	17	39	25.7	60	59.6	147	15.0	26.7	1.7	17	9	97	15	0.61	0.4	0.6	A	289	2	0.4	19	8	0.7	185	82	1.1
	14	23	19	4.6	60	59.5	147	15.8	30.0	2.0	19	11	59	15	0.53	0.3	0.5	A	15	4	0.6	284	5	0.4	143	84	1.0
	15	7	23	44.0	60	58.3	147	16.9	22.6	2.1	16	9	60	35	0.41	0.4	1.2	A	134	1	0.5	224	2	0.7	17	88	2.3
	15	15	16	45.7	60	58.9	147	17.2	29.9	2.3	17	8	59	34	0.41	0.4	0.8	A	81	1	0.6	140	4	0.5	337	59	1.3
	15	21	27	22.8	60	24.0	147	35.9	27.3	2.9	30	8	70	55	0.47	0.4	0.8	A	2	1	0.8	272	8	0.5	99	82	1.5
	16	2	59	10.1	61	29.0	146	14.4	36.0	3.1	25	6	83	17	0.64	0.6	0.5	A	267	27	0.8	18	35	1.3	149	43	0.7
	16	8	14	42.0	60	58.0	147	15.1	15.8	2.3	27	10	46	37	0.41	0.4	0.8	A	274	7	0.5	182	12	0.7	34	76	1.5
	17	7	8	12.4	61	3.3	147	2.2	11.2	2.6	22	12	41	39	0.67	0.3	0.7	A	291	0	0.4	201	1	0.6	21	89	1.4
	18	15	45	23.8	60	58.3	147	15.3	29.4	3.1	17	7	59	36	0.42	0.4	0.9	A	1	0	0.8	271	2	0.6	91	88	1.7
	19	11	51	46.6	61	0.1	147	15.8	21.1	2.1	21	11	83	34	0.57	0.3	0.8	A	109	2	0.4	199	3	0.6	345	86	1.6
	21	12	13	8.5	61	0.6	147	19.1	18.5	2.0	17	8	59	31	0.42	0.4	0.9	A	197	1	0.7	288	3	0.5	89	87	1.7
	22	12	2	9.4	60	57.5	147	18.1	13.6	2.3	17	11	61	56	0.55	0.3	0.6	A	199	9	0.6	291	13	0.4	75	74	1.2
	23	9	59	14.7	61	21.3	147	34.9	26.7	2.2	26	14	52	22	0.50	0.3	0.6	A	268	1	0.4	178	4	0.6	12	86	1.1
	23	23	15	22.1	61	0.2	147	17.1	32.2	2.4	19	11	79	53	0.70	0.4	0.4	A	91	7	0.5	185	32	0.7	350	57	0.9
	24	1	47	2.0	60	58.1	147	17.1	14.3	2.1	21	10	46	55	0.52	0.4	0.8	A	190	7	0.6	282	18	0.6	80	71	1.6
	24	21	45	42.5	60	57.7	147	17.4	12.1	1.9	21	11	52	36	0.42	0.3	0.6	A	194	6	0.6	285	10	0.5	73	78	1.2
	25	12	39	29.4	60	58.0	147	15.5	13.4	2.1	19	9	52	37	0.32	0.3	0.7	A	191	3	0.6	281	5	0.5	70	84	1.2
	26	7	16	25.3	60	58.0	147	14.4	27.7	2.2	18	6	59	37	0.51	0.4	0.8	A	197	2	0.8	107	6	0.6	305	84	1.4
	30	6	38	56.8	61	0.1	147	15.0	24.5	2.7	21	4	84	16	0.95	0.6	1.0	A	297	9	0.6	206	12	1.1	63	75	1.9
	30	6	38	44.0	60	58.0	147	15.6	23.7	1.7A	14	6	116	13	0.39	0.5	0.7	A	27	8	1.0	295	16	0.5	143	72	1.4
	30	20	54	15.9	61	0.9	147	6.9	12.6	2.2	18	7	62	14	0.29	0.4	0.7	A	195	11	0.8	289	20	0.5	78	67	1.4
OCT	1	16	45	42.0	60	58.2	147	16.4	23.3	2.4	20	6	117	14	0.46	0.4	0.8	A	1	3	0.8	271	4	0.5	128	85	1.5
	1	20	55	50.4	60	56.2	147	16.8	11.8	2.0	22	10	109	12	0.42	0.4	0.6	A	277	14	0.4	183	16	0.7	46	69	1.1
	2	7	0	29.8	60	56.8	147	15.7	16.4	2.4	24	10	109	12	0.54	0.4	0.7	A	280	13	0.5	186	16	0.7	47	69	1.4
	2	15	18	13.5	60	58.0	147	15.4	14.9	2.2	21	4	115	13	0.41	0.5	0.7	A	1	5	0.9	270	7	0.5	126	81	1.4
	2	23	51	55.5	60	56.8	147	17.2	13.1	2.1	16	4	124	13	0.30	0.6	0.7	A	199	5	1.0	291	18	0.6	94	71	1.4
	3	0	11	38.8	60	57.5	147	18.1	15.4	2.1	18	6	123	15	0.35	0.4	0.9	A	190	5	0.8	281	7	0.5	65	81	1.6
	3	3	59	2.7	60	57.4	147	20.0	22.5	2.6	19	4	124	16	0.37	0.5	1.0	A	181	1	0.9	272	8	0.5	84	82	1.9
	5	16	39	25.8	60	44.3	145	9.4	26.8	0.7A	3	3	222	23	0.15	3.4	1.0	C	301	4	6.3	33	16	0.9	197	73	1.9
	6	5	4	0.7	60	59.9	147	22.2	16.3	2.1	19	15	117	20	0.79	0.3	0.5	A	192	5	0.6	283	9	0.3	73	80	1.0
	6	19	2	5.5	60	59.9	147	16.8	17.4	2.1	21	13	60	17	0.50	0.3	0.6	A	12	2	0.5	282	4	0.4	129	86	1.2
	7	2	32	1.1	60	32.6	145	21.7	18.8	1.6	19	5	114	9	0.61	0.4	0.5	A	7	6	0.8	98	9	0.6	244	79	1.0
	7	6	15	42.6	61	37.3	146	55.5	26.9	2.3	22	13	78	32	0.66	0.4	0.6	A	89	4	0.4	180	13	0.6	342	76	1.1
	9	3	32	13.5	60	57.5	147	18.3	17.3	2.5	29	9	47	15	0.55	0.4	0.8	A	210	10	0.8	302	11	0.5	79	75	1.6
	10	9	28	26.9	60	58.4	147	15.7	27.2	3.0	21	7	59	14	0.66	0.4	0.8	A	269	1	0.4	179	3	0.8	17	87	1.5
	12	8	34	16.3	61	0.3	147	12.9	23.0	2.1	22	11	57	15	0.42	0.4	0.7	A	192	4	0.7	283	10	0.4	81	79	1.4
	12	21	0	54.9	61	7.4	147	46.9	28.9	3.6	23	3	52	7	0.34	0.5	0.6	A	123	10	0.5	218	26	0.8	14	62	1.1
			3.7	MB							FELT (III) AT ANCHORAGE AND CHUGIAK. FELT (II) AT PALMER.																
	13	11	24	15.1	60	59.1	147	16.6	28.4	2.3	25	15	53	15	0.65	0.3	0.5	A	192	3	0.6	283	6	0.4	76	83	1.0
	18	12	25	49.1	61	29.8	146	45.3	43.0	3.6	22	2	66	45	0.60	0.6	2.2	B	288	2	0.8	198	4	1.1	45	86	4.2
			4.2	MB							FELT (II) AT ANCHORAGE AND VALDEZ.																
	19	0	7	39.7	61	3.1	147	7.9	11.2	2.0	15	11	112	44	0.60	0.4	0.7	A	5	3	0.7	275	6	0.4	122	83	1.2
	20	15	30	57.4	61	31.2	145	58.5	32.4	2.2	24	11	102	4	0.72	0.5	0.4	A	148	22	0.5	81	38	0.8	269	42	0.6
	22	1	11	47.1	61	0.1	147	19.0	21.5	3.1	29	1	52	18	0.41	0.5	0.8	A	181	2	0.9	272	9	0.6	79	81	1.6
	23	9	33	29.3	60	48.5	144	40.2	30.0	1.7	15	10	70	42	0.46	0.9	1.5	B	353	7	0.8	87	27	0.6	250	62	3.2
	25	3	8	23.5	61	24.0	146	32.6	21.7	2.7	24	8	58	32	0.59	0.3	0.8	A	179	1	0.6	269	10	0.5	83	80	1.5
	27	18	35	51.7	60	25.1	144	57.2	17.4	1.3A	11	4	188	19	0.52	1.4	1.3	B	90	30	0.9	202	33	1.7	328	42	3.2

1983 VALDEZ AREA EARTHQUAKES

1983	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	DI KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
OCT 27	19	18	59.4	60	56.9	147	16.8	16.0	2.6	30	12	88	13	0.78	0.3	0.6	A	184	6	0.6	275	8	0.4	58	80	1.1
29	14	24	36.9	61	22.8	146	41.8	30.0	2.3	22	5	54	34	0.78	0.4	0.9	A	189	2	0.7	279	11	0.5	89	79	1.6
NOV 3	13	5	39.1	61	0.1	147	14.3	30.5	2.8	19	9	58	15	0.51	0.4	0.5	A	295	2	0.5	26	14	0.6	197	76	1.0
7	0	4	47.2	60	59.9	147	14.8	19.9	2.3	19	9	66	15	0.45	0.4	1.0	A	32	1	0.7	302	8	0.5	129	82	1.8
9	15	39	8.1	60	58.8	147	15.1	15.1	2.2	22	12	67	36	0.45	0.3	0.8	A	186	2	0.6	277	4	0.4	70	85	1.4
10	12	0	16.0	60	19.3	147	44.1	19.3	2.0	21	7	92	48	0.46	0.5	0.9	A	182	12	0.8	275	18	0.6	60	68	1.9
11	13	42	5.8	60	24.5	147	43.3	20.6	2.1	32	10	77	57	0.49	0.4	1.1	A	162	7	0.7	261	12	0.5	44	74	2.1
13	2	6	0.5	60	56.8	147	19.3	16.3	2.6	33	11	47	15	0.48	0.4	0.6	A	196	4	0.7	286	9	0.4	82	80	1.2
13	2	30	6.4	60	57.7	147	16.6	23.0	1.9	28	9	46	14	0.44	0.4	0.6	A	8	1	0.7	278	14	0.4	102	76	1.1
18	15	53	52.6	61	22.7	146	51.9	16.0	2.3	26	7	51	40	0.50	0.4	0.9	A	9	2	0.7	279	7	0.4	115	83	1.7
20	16	55	57.1	61	0.7	147	15.8	29.4	2.6	22	7	45	17	0.41	0.4	0.5	A	276	0	0.5	6	1	0.8	186	89	1.0
21	0	12	31.1	60	32.9	145	17.4	13.4	1.5	15	10	112	5	0.54	0.5	0.5	A	98	20	0.6	355	33	0.8	214	50	1.0
21	0	37	10.4	60	28.0	145	12.5	17.8	0.9A	7	3	187	8	0.48	2.0	0.9	B	161	10	3.8	261	25	1.2	52	62	1.6
22	8	55	29.2	60	56.8	147	17.1	16.2	1.9	29	10	47	13	0.45	0.5	0.6	A	300	7	0.4	207	21	0.8	47	68	1.2
22	13	41	40.5	61	23.7	147	43.6	28.5	2.7	29	10	58	39	0.54	0.4	0.5	A	190	3	0.8	100	7	0.5	303	82	1.0
DEC 1	16	46	45.0	61	1.5	147	13.7	20.9	2.1	23	10	93	17	0.47	0.4	0.8	A	2	1	0.7	271	13	0.4	96	77	1.5
1	17	36	53.2	60	26.4	147	44.3	21.0	2.1	23	10	78	57	0.45	0.4	0.9	A	280	4	0.5	189	10	0.8	31	79	1.8
2	8	0	54.8	61	19.8	145	45.1	29.1	2.6	28	10	76	20	0.77	0.4	0.5	A	203	6	0.8	295	17	0.5	94	72	1.0
2	17	50	37.7	60	32.8	144	39.8	10.2	0.9A	8	5	131	30	0.56	0.5	0.9	A	124	17	0.6	29	18	0.8	255	65	1.8
3	14	50	31.4	61	12.4	144	54.8	37.6	1.3	9	7	106	23	0.59	0.6	0.6	A	319	25	0.7	81	32	1.4	205	41	0.7
4	9	31	7.9	60	23.2	145	0.1	24.3	1.2A	11	7	146	20	0.65	0.7	1.2	A	29	7	1.3	121	15	0.8	275	73	2.3
4	16	12	30.1	60	57.8	147	15.8	17.2	2.7	34	16	46	13	0.61	0.3	0.6	A	194	8	0.5	286	11	0.4	69	76	1.1
5	16	14	0.2	61	0.8	147	11.4	27.7	2.2	27	15	56	15	0.58	0.3	0.4	A	285	5	0.4	16	8	0.6	163	81	0.8
6	15	30	14.5	60	24.5	144	56.3	22.2	0.9	11	5	188	20	0.42	0.7	0.8	A	209	9	1.3	114	26	0.7	316	62	1.7
11	8	30	39.6	60	58.5	147	14.4	29.6	2.5	22	8	59	37	0.46	0.4	0.6	A	265	1	0.4	175	15	0.7	359	75	1.2
11	10	2	48.7	61	1.0	147	16.3	30.0	2.3	25	8	58	18	0.45	0.4	0.6	A	112	6	0.5	20	19	0.7	219	70	1.1
11	17	51	56.7	61	21.5	147	3.1	14.1	2.6	22	7	47	43	0.66	0.4	0.6	A	281	9	0.5	189	13	0.8	45	74	1.2
12	23	37	38.0	61	1.6	147	12.6	23.2	2.4	25	10	57	17	0.47	0.3	0.7	A	14	0	0.6	284	7	0.4	104	83	1.3
14	0	10	35.4	61	17.7	146	50.5	29.5	2.4	23	11	48	33	0.57	0.3	0.7	A	265	3	0.4	356	4	0.5	139	85	1.3
17	11	20	19.9	61	0.7	147	17.1	29.7	2.3	22	11	58	18	0.45	0.4	0.6	A	284	3	0.5	16	23	0.7	187	67	1.2
18	7	58	37.8	61	22.8	146	46.1	14.6	2.0	21	9	53	38	0.75	0.4	0.6	A	195	4	0.7	286	10	0.5	84	79	1.1
19	0	50	25.2	61	20.5	147	9.2	21.4	2.0	21	9	55	37	0.42	0.4	0.9	A	188	1	0.7	278	3	0.5	80	87	1.7
21	11	51	6.1	61	1.8	147	6.1	13.7	2.4	25	7	55	16	0.42	0.3	0.6	A	278	4	0.4	8	5	0.6	149	84	1.2
21	23	19	47.5	60	24.2	145	8.8	18.5	1.2A	7	6	197	15	0.35	1.0	0.8	A	223	11	1.8	128	28	0.7	332	60	1.6
22	1	12	36.6	60	33.4	144	52.5	17.8	1.3A	11	7	137	18	0.46	0.6	0.8	A	4	25	0.8	107	27	0.6	238	52	1.7
22	17	4	51.6	60	59.6	147	19.3	22.1	2.0	24	10	59	18	0.57	0.4	0.6	A	12	0	0.7	282	4	0.5	102	86	1.2
23	16	48	51.9	60	26.1	147	42.9	25.5	2.4	35	7	74	58	0.54	0.5	0.7	A	2	5	0.9	272	8	0.5	124	81	1.3
24	21	46	49.0	60	33.5	144	43.0	16.1	1.6	21	12	98	27	0.70	0.4	0.5	A	9	14	0.6	106	24	0.4	252	62	1.1
28	10	44	56.8	60	33.5	144	45.0	11.0	0.8A	8	4	132	25	0.37	1.1	2.6	B	113	14	0.8	19	15	1.3	244	69	5.3
29	18	14	5.5	60	24.9	145	10.4	16.3	0.5	9	6	195	13	0.35	0.8	0.7	A	224	1	1.5	133	27	0.7	316	63	1.4
30	5	3	52.9	60	57.9	147	15.1	29.6	2.3	24	6	59	13	0.51	0.5	0.8	A	109	3	0.6	18	12	0.9	213	78	1.4
31	3	52	0.7	61	0.6	147	11.6	21.6	2.3	21	10	57	15	0.42	0.5	0.8	A	14	6	0.8	282	11	0.5	132	77	1.6

APPENDIX B
Relocated Earthquakes of 1983 Columbia Bay Sequence

RELOCATED EARTHQUAKES OF 1983 COLUMBIA BAY SEQUENCE

1983	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
JUL 12	15	10	3.7	61	2.1	147	11.1	29.8	6.3S	21	0	79	80	0.09	0.5	0.7	A	279	8	0.7	188	8	1.0	54	79	1.3
16	5	37	50.1	61	2.4	147	13.5	31.1	1.8	19	13	65	16	0.31	0.3	0.3	A	290	0	0.5	20	2	0.6	200	88	0.5
16	7	10	37.9	61	1.9	147	7.6	24.6	1.7	26	15	46	11	0.32	0.3	0.4	A	201	2	0.6	291	9	0.4	99	81	0.7
16	11	47	56.7	60	57.8	147	15.6	25.6	2.2	21	11	86	19	0.30	0.3	0.4	A	292	8	0.5	199	17	0.6	46	71	0.8
16	13	48	10.0	61	6.3	146	53.2	22.6	1.9	20	16	35	19	0.35	0.3	0.5	A	99	3	0.4	9	13	0.5	202	77	0.9
16	16	42	58.4	61	2.4	147	7.4	26.2	1.7	23	12	42	10	0.23	0.4	0.4	A	286	9	0.5	22	34	0.7	183	55	0.8
16	17	45	42.3	61	0.0	147	17.0	29.4	2.0	21	14	84	17	0.26	0.3	0.4	A	280	7	0.5	189	7	0.6	55	80	0.7
16	22	19	36.0	61	4.3	147	2.2	26.9	1.9	20	15	35	15	0.31	0.3	0.4	A	277	7	0.5	9	18	0.6	167	71	0.7
16	22	42	39.3	60	58.5	147	13.2	24.1	2.0	21	15	45	15	0.40	0.3	0.4	A	187	5	0.6	278	8	0.4	65	81	0.8
17	13	12	29.9	61	0.3	147	15.2	30.4	2.5	22	14	73	16	0.24	0.4	0.3	A	294	26	0.5	47	38	0.7	179	41	0.6
17	14	48	21.8	61	0.0	147	16.1	28.5	1.8	23	15	83	16	0.32	0.3	0.4	A	282	12	0.4	188	16	0.6	47	70	0.7
17	14	52	21.4	61	6.9	146	55.8	27.7	2.4	22	12	34	21	0.26	0.4	0.4	A	264	8	0.5	359	32	0.6	162	57	0.9
17	23	1	30.9	61	4.3	147	2.3	26.3	1.7	23	13	35	15	0.29	0.4	0.4	A	270	8	0.5	3	27	0.6	165	62	0.8
18	8	9	46.7	61	0.1	147	14.9	30.0	2.6	22	17	71	16	0.22	0.3	0.3	A	283	25	0.5	175	34	0.6	41	46	0.7
18	11	30	57.7	60	59.4	147	18.5	28.0	1.9	21	16	85	17	0.36	0.3	0.4	A	177	14	0.6	271	15	0.4	46	69	0.8
18	12	8	13.1	60	59.9	147	15.9	29.9	1.9	20	14	83	16	0.23	0.3	0.3	A	284	19	0.4	177	40	0.6	33	44	0.7
18	13	42	9.8	60	59.9	147	12.7	25.7	1.9	21	14	43	14	0.28	0.3	0.4	A	282	11	0.4	189	12	0.6	53	74	0.8
18	15	20	1.0	61	0.1	147	14.3	29.1	2.1	20	11	64	15	0.23	0.4	0.4	A	169	9	0.7	263	27	0.5	62	61	0.8
18	19	26	43.2	60	59.3	147	18.3	28.2	2.8	21	13	85	21	0.31	0.3	0.4	A	198	16	0.6	293	18	0.5	69	66	0.8
19	5	51	35.8	61	5.2	146	57.6	24.4	2.1	19	13	37	22	0.30	0.3	0.4	A	287	4	0.5	17	10	0.6	175	79	0.9
19	5	58	49.4	61	0.8	147	17.2	30.6	1.8	19	12	96	19	0.30	0.4	0.3	A	291	8	0.4	25	28	0.7	186	61	0.5
19	8	47	25.5	61	0.6	147	14.6	31.2	2.1	20	12	82	17	0.32	0.4	0.3	A	6	21	0.7	262	32	0.4	123	50	0.6
20	1	29	49.8	61	1.6	147	8.4	26.3	2.3	19	10	78	16	0.24	0.3	0.5	A	205	7	0.6	297	13	0.5	87	75	0.9
20	20	11	31.0	60	59.8	147	16.7	31.6	3.2	20	6	84	19	0.24	0.5	0.3	A	3	8	0.9	100	42	0.7	264	47	0.5
21	10	25	18.3	61	0.8	147	10.9	24.2	2.1	18	14	46	15	0.37	0.3	0.5	A	21	0	0.6	291	9	0.4	111	81	0.9
21	15	43	51.6	61	2.2	147	8.0	24.0	2.2	19	13	43	17	0.35	0.3	0.5	A	276	7	0.4	7	7	0.6	142	80	0.9
21	23	26	13.3	61	4.2	147	2.1	21.7	1.8	16	13	61	20	0.54	0.4	0.5	A	284	6	0.4	16	20	0.6	178	69	1.1
22	6	2	4.3	61	5.7	146	59.1	28.0	2.9	20	12	61	19	0.19	0.3	0.4	A	22	8	0.6	291	10	0.4	150	77	0.7
22	12	50	19.2	61	2.6	147	12.6	31.9	2.9	22	9	46	15	0.33	0.4	0.3	A	20	6	0.7	113	24	0.6	277	65	0.5
23	4	34	0.2	61	1.9	147	10.3	30.0	1.9	22	13	39	13	0.28	0.4	0.3	A	24	10	0.8	288	29	0.4	131	59	0.6
24	14	47	45.8	61	4.8	146	59.8	29.8	2.5	21	12	33	18	0.45	0.3	0.3	A	280	1	0.4	11	38	0.6	189	52	0.7
SEP 7	19	22	5.0	60	58.7	147	19.2	30.0	6.3S	13	0	112	78	0.12	0.7	0.9	A	106	1	0.9	196	7	1.3	8	83	1.6
12	3	18	26.5	60	58.4	147	21.1	33.9	2.5	20	10	93	18	0.23	0.3	0.3	A	190	22	0.7	87	30	0.6	311	51	0.4
12	3	33	42.8	60	58.9	147	17.8	34.8	1.8	20	12	94	16	0.31	0.4	0.3	A	184	10	0.8	283	42	0.5	83	46	0.6
12	6	52	35.2	60	58.6	147	17.9	28.5	2.0	20	13	96	15	0.22	0.3	0.4	A	291	5	0.5	24	35	0.6	194	55	0.7
12	7	31	26.2	61	1.2	147	18.7	31.3	1.9	20	15	79	18	0.23	0.4	0.3	A	280	22	0.4	179	25	0.7	46	56	0.6
12	11	46	10.4	60	59.6	147	18.2	31.3	2.4	20	12	89	16	0.25	0.3	0.3	A	114	7	0.4	207	23	0.6	8	66	0.5
12	14	28	20.3	60	58.6	147	18.4	30.5	2.7	20	12	95	16	0.48	0.4	0.3	A	281	4	0.4	189	18	0.8	23	71	0.6
12	16	46	16.3	60	58.3	147	23.6	30.2	1.6	19	13	89	19	0.20	0.4	0.4	A	275	2	0.5	183	30	0.7	8	60	0.6
12	19	50	0.6	60	59.8	147	18.9	33.2	2.2	21	14	87	16	0.28	0.3	0.3	A	8	12	0.6	273	22	0.4	125	65	0.5
13	2	11	7.8	60	58.6	147	18.2	34.1	2.2	23	12	96	16	0.26	0.4	0.3	A	171	6	0.7	81	36	0.5	269	54	0.5
13	2	25	26.3	60	57.8	147	17.5	27.0	2.6	24	13	87	15	0.48	0.3	0.3	A	9	6	0.5	277	12	0.4	125	76	0.6
13	5	34	45.3	60	57.6	147	19.7	32.6	1.6	20	11	101	16	0.30	0.5	0.3	A	174	3	1.0	265	21	0.5	76	69	0.6
13	9	24	25.5	60	59.5	147	16.8	29.3	2.9	24	11	84	16	0.21	0.4	0.3	A	99	5	0.5	191	21	0.7	356	68	0.6
13	10	49	3.8	60	57.6	147	18.6	28.0	2.8	23	13	87	15	0.23	0.3	0.3	A	282	5	0.4	14	17	0.6	176	72	0.6
13	11	50	0.7	60	58.9	147	16.3	26.4	1.8	20	12	96	15	0.30	0.3	0.4	A	277	5	0.5	9	22	0.6	175	67	0.7
13	18	37	46.3	61	0.4	147	20.6	31.9	1.9	18	8	80	22	0.19	0.4	0.4	A	273	7	0.5	181	18	0.8	23	71	0.7
13	21	59	45.5	60	58.9	147	18.4	29.1	1.8	19	12	93	16	0.22	0.4	0.5	A	281	1	0.5	11	4	0.7	177	86	0.9
14	0	0	38.2	60	58.6	147	15.9	26.3	1.9	20	11	85	15	0.21	0.4	0.4	A	263	3	0.5	356	43	0.8	170	47	0.8
14	1	37	34.9	61	0.1	147	17.5	31.2	1.7	20	12	87	17	0.20	0.4	0.3	A	275	15	0.4	179	23	0.7	35	62	0.6
14	2	35	10.5	60	57.8	147	18.4	34.3	3.8	21	5	101	15	0.36	0.5	0.3	A	200	12	0.9	102	34	0.6	307	53	0.6

RELOCATED EARTHQUAKES OF 1983 COLUMBIA BAY SEQUENCE

1983	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
SEP 14	3	7	58.6	60	58.5	147	17.9	28.9	1.8	19	12	115	15	0.32	0.4	0.4	A	270	9	0.4	8	42	0.7	170	47	0.9
14	3	40	6.1	60	59.9	147	19.2	33.4	2.2	21	13	86	16	0.24	0.4	0.3	A	196	3	0.7	104	35	0.5	290	55	0.5
14	12	45	4.8	60	57.5	147	21.8	27.4	1.8	20	13	99	17	0.32	0.4	0.4	A	275	9	0.4	180	31	0.8	19	58	0.8
14	16	3	53.1	60	59.5	147	17.2	35.2	2.3	21	12	91	16	0.36	0.4	0.3	A	171	15	0.7	81	32	0.6	284	55	0.5
14	17	39	25.2	60	59.7	147	17.3	30.3	1.7	20	12	89	16	0.33	0.4	0.3	A	279	18	0.4	180	25	0.7	41	58	0.6
14	23	19	4.3	60	59.8	147	17.6	34.1	2.0	21	13	89	17	0.34	0.3	0.3	A	178	21	0.7	281	30	0.4	59	52	0.5

APPENDIX C
1984 Valdez Area Earthquakes

1984 VALDEZ AREA EARTHQUAKES

1984	DAY	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	DI KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
JAN	4	20	14	8.6	60	50.8	145	10.2	25.0	1.6	19	8	45	34	0.51	0.3	0.5	A	33	4	0.6	124	16	0.5	289	73	1.0
	6	7	33	57.3	60	35.3	145	7.4	17.2	1.0	8	4	97	8	0.40	0.9	0.9	A	5	22	0.8	112	35	1.1	250	47	2.2
	6	11	2	21.9	60	26.7	145	2.8	17.9	1.7	17	6	162	13	0.53	0.6	0.8	A	101	16	0.6	7	16	1.1	234	67	1.5
	16	4	53	40.6	60	23.8	145	0.1	22.5	1.5	19	7	137	19	0.70	0.6	0.6	A	112	24	0.6	221	36	1.2	356	44	1.3
	17	12	53	57.8	60	29.9	144	44.7	21.3	0.7A	9	4	155	26	0.25	0.6	0.9	A	124	17	0.7	27	23	1.0	247	61	1.9
	17	22	27	27.5	60	24.2	144	55.0	19.4	0.8A	11	5	194	22	0.53	1.1	0.8	A	214	19	2.1	117	20	0.7	344	62	1.6
	17	22	37	17.5	60	25.6	144	55.5	24.2	1.1A	11	3	186	20	0.38	1.3	1.0	A	117	13	0.8	213	26	2.5	3	61	1.6
	18	1	18	13.1	61	2.3	147	4.3	14.5	3.0	31	5	48	17	0.47	0.5	0.7	A	194	1	0.9	284	13	0.6	100	77	1.4
	18	7	31	17.0	60	49.3	144	36.7	8.4	1.5	16	2	65	16	0.60	0.7	1.4	A	81	13	1.1	154	22	0.8	318	60	2.7
	19	2	16	30.1	60	35.9	147	21.0	20.8	2.1	27	10	71	36	0.55	0.5	1.0	A	178	8	0.9	270	14	0.4	59	74	2.0
	22	2	41	30.8	60	59.2	147	16.2	17.1	2.0	25	11	87	15	0.66	0.5	0.7	A	184	3	0.9	275	18	0.5	85	72	1.4
	22	2	44	51.4	60	25.8	145	4.9	19.5	0.8A	9	8	165	13	0.93	0.7	1.0	A	200	2	1.2	109	25	0.9	294	65	2.0
	22	7	42	30.4	60	36.5	144	44.7	19.6	1.1	10	9	114	27	0.42	0.6	1.0	A	145	15	0.6	81	28	0.7	265	50	1.7
	22	12	20	48.3	60	43.3	145	54.1	24.8	1.9	22	10	66	21	0.60	0.5	0.6	A	261	2	0.7	137	7	0.5	2	55	1.0
	22	20	9	25.5	60	26.9	145	1.8	19.9	2.2	23	12	64	14	0.51	0.4	0.6	A	18	9	0.8	110	18	0.5	262	70	1.1
	23	4	42	9.2	60	21.9	147	35.0	26.1	2.3	32	10	72	51	0.51	0.5	0.9	A	273	5	0.6	5	20	0.9	170	69	1.7
	25	21	19	55.5	61	26.3	146	51.2	19.1	2.9	22	9	57	44	0.57	0.4	0.9	A	193	1	0.8	283	9	0.5	97	81	1.6
	26	1	22	30.5	60	30.2	145	8.4	16.4	1.4	12	9	168	5	0.52	0.5	0.5	A	10	13	0.9	106	26	0.6	256	61	1.1
	26	6	40	36.7	61	18.5	146	46.3	19.0	2.0	21	13	66	31	0.56	0.4	0.7	A	192	4	0.6	283	12	0.5	84	77	1.3
	27	16	16	38.6	60	59.5	146	59.1	18.1	2.1	19	13	59	12	0.67	0.3	0.6	A	196	1	0.6	287	11	0.5	101	79	1.1
FEB	7	9	28	37.2	60	58.1	147	15.9	18.8	1.9	25	9	51	36	0.37	0.4	0.8	A	288	11	0.4	195	12	0.7	59	74	1.6
	10	22	17	45.2	61	33.8	146	18.5	29.8	2.5	21	7	87	22	0.60	0.5	0.6	A	284	1	0.6	194	20	0.9	17	70	1.2
	11	14	3	41.2	60	23.9	145	11.2	15.3	0.8	8	5	199	15	0.44	2.0	1.1	B	34	9	3.7	134	44	0.9	295	44	2.5
	16	2	29	30.3	60	34.9	145	6.4	11.9	1.7	24	11	106	8	1.07	0.4	0.6	A	8	13	0.6	104	23	0.5	251	63	1.2
	17	11	22	6.8	61	1.4	147	6.3	12.7	2.0	20	13	91	43	0.43	0.4	0.7	A	206	13	0.6	300	14	0.5	75	71	1.3
	19	8	37	37.9	60	58.6	147	15.9	18.1	2.3	22	9	59	14	0.45	0.4	0.8	A	306	5	0.4	215	9	0.6	65	80	1.6
	27	3	21	39.8	61	22.6	146	48.8	18.6	2.1	23	11	55	38	0.50	0.3	0.7	A	190	5	0.6	281	13	0.4	79	76	1.3
	29	7	29	3.3	60	57.6	147	16.5	15.2	2.1	23	9	87	45	0.38	0.5	1.1	A	183	11	0.8	277	15	0.5	58	71	2.3
	29	14	3	59.2	61	1.4	147	15.0	21.0	2.3	23	8	81	48	0.41	0.4	1.0	A	192	6	0.7	284	14	0.5	79	75	2.0
MAR	2	13	20	20.1	61	30.5	146	24.2	22.0	2.9	28	5	79	42	0.60	0.4	0.9	A	304	2	0.6	34	4	0.8	187	86	1.7
	4	19	14	3.5	61	20.3	146	40.6	23.5	2.2	19	9	62	30	0.65	0.4	0.6	A	195	6	0.7	286	8	0.5	69	80	1.2
	11	2	18	29.0	60	15.5	144	54.8	34.2	1.3A	9	6	202	35	0.90	1.0	0.9	A	279	10	0.9	184	28	1.9	27	60	1.6
	11	6	34	4.2	60	36.4	145	8.7	13.4	1.6	12	8	82	9	0.64	0.6	0.7	A	342	7	0.8	81	38	0.6	243	51	1.6
	12	7	31	2.9	60	26.4	145	25.4	13.1	0.9	10	4	216	16	0.25	1.5	0.8	B	39	17	2.9	141	35	1.0	288	50	1.3
	12	19	49	39.3	60	59.2	147	13.8	29.7	2.4	26	12	83	51	0.58	0.3	0.6	A	0	0	0.6	270	5	0.4	90	85	1.0
	14	11	53	47.9	60	23.1	147	35.6	29.7	2.4	34	12	70	53	0.53	0.4	0.6	A	261	2	0.5	351	27	0.6	167	63	1.2
	16	3	10	18.8	60	55.2	147	14.0	20.7	2.5	28	12	47	54	0.43	0.4	1.0	A	183	9	0.7	275	11	0.4	55	76	2.0
	16	23	2	57.0	61	19.0	146	43.1	22.2	2.1	23	8	56	29	0.61	0.4	0.6	A	290	4	0.4	199	7	0.7	49	82	1.2
	17	18	50	35.4	61	35.7	146	20.5	32.0	2.2	21	7	87	25	0.64	0.6	0.6	A	116	6	0.6	211	34	0.9	17	55	1.3
	20	0	22	14.7	60	30.0	145	30.0	14.1	0.4A	8	4	244	17	0.22	1.6	1.0	B	45	12	3.1	310	22	1.5	162	65	1.9
	20	15	20	57.7	60	46.6	144	38.8	27.7	1.7	23	11	57	21	0.56	0.4	0.5	A	39	22	0.6	139	23	0.5	270	57	1.2
	22	22	30	59.1	60	24.4	145	4.5	18.4	1.5	13	8	148	16	0.63	0.7	0.7	A	21	20	1.3	125	33	0.7	265	50	1.6
	23	0	27	20.1	60	23.2	145	6.3	21.1	1.1A	9	4	244	17	0.43	1.1	1.0	A	25	20	1.8	133	39	1.1	274	44	2.4
	29	6	8	34.4	61	18.3	146	49.9	26.9	2.1	24	9	58	33	0.68	0.4	0.7	A	283	5	0.5	192	5	0.8	58	83	1.4
	30	17	50	58.5	61	3.8	146	10.7	13.7	2.1	24	7	58	11	0.60	0.4	0.5	A	30	4	0.8	121	21	0.6	290	69	1.0
	30	22	31	34.1	60	56.3	147	18.6	12.1	2.1	30	10	47	56	0.43	0.4	0.6	A	285	11	0.5	192	14	0.8	52	72	1.2
APR	1	6	29	23.0	61	1.1	147	32.8	8.9	1.9	28	16	86	46	0.77	0.4	0.5	A	173	5	0.7	264	14	0.4	64	75	1.0
	1	10	5	39.3	60	35.2	147	23.2	28.0	2.1	26	14	130	53	0.57	0.4	0.7	A	187	1	0.8	277	5	0.4	86	85	1.4
	4	9	32	26.2	60	41.6	144	59.6	28.3	1.1	13	6	79	21	0.36	0.8	0.8	A	156	5	0.8	81	42	0.8	251	46	1.9
	4	12	13	47.7	61	37.6	146	23.6	21.1	2.9	24	8	85	55	0.61	0.5	1.0	A	117	1	0.7	27	3	0.9	225	87	1.9
	4	19	56	15.8	60	38.2	144	49.9	17.1	0.8	10	4	104	24	0.53	1.1	1.4	B	164	1	0.9	81	35	1.3	255	54	3.0

1984 VALDEZ AREA EARTHQUAKES

1984		ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
APR	9	9	30	31.4	60	23.9	144	57.6	23.7	0.8	12	6	171	20	0.55	0.9	0.9	A	116	17	0.7	14	36	1.6	227	49	1.8
	10	19	15	44.1	61	59.0	147	31.8	38.4	2.0	21	8	167	20	0.73	1.1	0.7	A	342	19	2.2	86	35	0.7	229	49	1.2
	15	7	15	20.1	60	16.1	144	51.9	28.7	1.2	13	6	144	34	0.53	1.2	0.8	A	27	8	2.3	121	20	0.8	276	68	1.6
	18	2	11	13.3	60	22.8	145	2.8	7.3	0.6A	5	2	237	19	0.47	1.9	4.8	C	204	3	2.0	113	20	1.4	302	70	9.6
	19	0	46	5.5	61	8.9	147	15.7	11.1	2.4	28	7	41	31	0.70	0.3	0.6	A	188	7	0.6	279	13	0.5	70	75	1.1
	19	1	18	17.6	61	9.3	147	14.9	9.0	2.5	27	7	73	31	0.75	0.4	0.7	A	177	3	0.8	268	21	0.6	79	69	1.4
	19	14	35	23.4	60	56.4	147	25.2	12.0	2.1	26	11	52	50	0.43	0.4	0.7	A	189	3	0.8	280	19	0.5	90	71	1.3
	20	7	40	38.1	60	55.8	147	14.5	23.5	2.5	27	14	49	42	0.51	0.3	0.8	A	198	7	0.5	289	10	0.4	73	78	1.5
	21	12	1	18.9	60	59.8	147	13.6	18.8	2.5	27	6	85	15	0.57	0.5	0.8	A	20	1	0.9	290	10	0.6	116	80	1.5
	22	13	4	26.5	60	32.4	145	7.6	16.6	1.2A	7	3	145	5	0.34	1.4	0.8	B	212	23	2.8	107	33	1.1	330	48	1.3
	26	18	10	58.7	61	20.0	146	43.7	15.1	2.7	26	5	49	31	0.74	0.4	0.7	A	196	1	0.8	286	4	0.6	92	86	1.3
	28	2	5	28.6	61	0.9	147	16.2	16.4	1.9	22	12	82	49	0.60	0.4	0.8	A	5	3	0.8	274	15	0.4	106	75	1.5
	30	18	0	43.3	61	41.6	146	47.2	21.1	2.0	18	10	96	33	0.74	0.6	1.3	A	121	4	0.8	212	7	1.2	2	82	2.5
MAY	2	0	22	53.6	61	20.0	146	50.1	30.3	2.9	26	7	48	35	0.57	0.4	0.5	A	120	5	0.6	29	7	0.7	245	81	1.0
	4	23	2	43.4	61	2.9	147	2.5	11.6	2.4	22	6	60	40	0.37	0.4	0.9	A	7	0	0.8	277	10	0.6	97	80	1.7
	6	3	52	27.5	61	36.1	146	17.4	34.8	2.8	26	9	90	23	0.72	0.5	0.4	A	296	11	0.7	32	32	1.0	189	56	0.8
	7	6	26	39.2	61	20.7	146	44.6	21.6	2.0	21	11	64	32	0.59	0.5	0.9	A	21	5	0.9	290	12	0.7	133	77	1.7
	8	1	50	57.9	60	35.0	145	6.8	16.0	1.1	8	7	153	8	0.42	1.0	1.3	A	124	6	1.9	30	32	1.0	223	57	2.8
	9	4	18	32.3	60	26.6	145	6.3	27.0	0.5A	6	5	266	12	0.12	4.6	1.9	C	170	10	4.0	264	19	9.2	54	68	1.9
	9	9	6	9.2	61	18.6	146	47.2	23.6	2.4	26	11	46	31	0.54	0.3	0.6	A	264	7	0.4	355	9	0.5	137	79	1.2
	10	8	55	29.8	60	59.9	147	16.0	20.9	2.6	31	11	45	16	0.58	0.3	0.6	A	9	0	0.6	279	9	0.4	99	81	1.2
	10	15	0	43.3	61	23.9	146	46.3	15.9	2.0	24	9	55	38	0.69	0.3	0.9	A	290	6	0.5	199	7	0.5	60	81	1.8
	12	14	19	3.3	60	19.8	147	43.7	23.8	2.0	33	9	81	48	0.40	0.4	0.7	A	170	5	0.8	261	13	0.5	59	76	1.3
	16	1	35	44.0	61	14.8	146	55.3	8.1	2.1	25	10	40	29	0.50	0.6	1.1	A	326	12	0.7	261	12	0.9	114	60	2.0
	18	22	30	47.5	60	36.4	147	31.4	30.0	2.2	26	8	67	40	0.72	0.6	0.5	A	273	29	0.7	26	36	0.9	155	41	1.3
	20	9	40	10.5	60	24.6	147	36.7	26.7	2.2	22	11	102	0	0.49	0.5	0.7	A	261	6	0.7	340	26	0.9	159	61	1.4
	27	5	43	4.0	60	29.8	145	1.6	11.6	0.8A	6	4	150	46	0.70	1.3	2.5	B	121	8	1.1	30	9	2.2	252	78	4.8
	28	8	30	52.7	60	32.8	144	54.7	17.2	1.5	12	10	142	16	0.59	0.7	0.9	A	124	13	0.6	26	31	0.8	234	56	2.0
	29	4	14	8.6	60	44.0	147	0.8	22.4	2.6	31	12	46	18	0.61	0.3	0.5	A	352	3	0.6	261	13	0.4	95	77	1.0
	31	8	35	19.9	61	0.0	146	55.1	16.1	2.0	26	16	34	15	0.49	0.4	0.7	A	261	7	0.5	352	9	0.7	134	79	1.4
	31	10	47	27.9	61	7.2	146	14.5	14.4	0.3	3	3	182	5	0.16	11.0	5.0	D	27	6	0.9	294	24	22.5	130	65	2.3
JUN	1	1	1	49.1	60	43.7	146	60.0	21.9	2.3	29	16	45	19	0.65	0.3	0.6	A	0	5	0.6	269	12	0.4	112	77	1.1
	1	19	23	58.9	61	9.1	146	31.3	11.8	1.1	9	7	148	11	0.23	0.9	0.9	A	34	5	0.6	128	42	2.1	299	48	1.3
	1	21	29	35.0	60	29.4	145	7.2	17.9	2.2	25	12	63	7	0.72	0.4	0.6	A	3	1	0.7	93	16	0.5	270	74	1.2
	1	22	5	2.7	60	27.3	145	2.4	15.6	1.9	22	9	106	13	0.78	0.5	0.7	A	81	14	0.6	172	22	0.9	320	64	1.4
	1	22	10	56.0	60	27.7	145	6.8	16.9	1.8	19	10	105	10	0.88	0.4	0.6	A	193	2	0.7	102	15	0.5	290	75	1.1
	2	8	49	16.3	60	16.7	147	0.2	10.7	2.7	34	9	56	31	0.42	0.4	0.6	A	169	7	0.7	261	16	0.5	56	72	1.1
	2	22	35	24.5	60	23.0	144	51.0	5.8	2.5	25	14	64	26	0.87	0.4	0.6	A	19	11	0.7	113	19	0.4	261	68	1.1
	8	22	10	17.8	61	30.9	147	24.1	18.4	2.1	23	15	62	36	0.51	0.4	1.1	A	205	6	0.8	296	11	0.6	87	77	2.1
	10	8	32	58.4	61	1.6	147	6.9	14.3	2.2	27	15	61	15	0.53	0.3	0.5	A	2	1	0.5	271	17	0.4	95	73	1.0
	13	13	5	1.0	61	57.3	147	46.2	29.0	2.4	27	7	106	27	0.69	0.6	0.8	A	261	0	0.9	351	0	1.1	0	90	1.5
	13	16	17	2.6	61	16.0	146	57.7	21.8	2.2	23	12	41	37	0.60	0.3	0.8	A	303	8	0.5	212	9	0.6	74	78	1.5
	15	7	19	12.0	61	39.3	146	52.8	21.4	2.7	24	6	86	31	0.59	0.5	1.0	A	309	3	0.7	219	6	1.0	66	83	1.8
	18	14	50	26.5	60	25.7	147	43.2	19.0	1.9	25	9	75	59	0.41	0.6	1.0	A	156	6	0.8	261	21	0.5	52	64	2.0
	19	14	26	2.5	61	24.0	146	51.8	38.4	2.1	23	8	53	41	0.56	0.6	0.5	A	261	8	0.9	140	9	0.8	19	57	0.8
	20	11	34	4.8	61	2.2	146	33.9	23.5	2.6	25	5	37	3	0.52	0.4	0.7	A	210	4	0.7	301	7	0.8	91	82	1.2
	23	23	7	48.8	61	42.9	147	21.0	26.0	2.7	28	9	83	13	0.72	0.4	0.7	A	281	3	0.6	191	7	0.8	34	82	1.3
	27	18	59	31.8	60	49.1	147	39.9	26.9	2.0	32	11	57	33	0.33	0.6	0.9	A	272	2	0.6	182	15	1.0	9	75	1.6
	29	7	28	33.0	61	23.4	147	29.1	18.6	2.0	28	13	59	28	0.51	0.4	0.7	A	192	5	0.7	283	12	0.5	80	77	1.3
JUL	1	14	55	13.0	60	29.8	145	5.1	14.6	1.5	19	11	113	8	0.75	0.5	0.6	A	12	4	0.9	104	16	0.5	268	73	1.1
	3	6	29	50.3	60	23.1	147	37.0	18.6	2.2	29	8	81	53	0.44	0.5	0.7	A	286	8	0.6	193	19	0.8	38	69	1.3

1984 VALDEZ AREA EARTHQUAKES

1984	DAY	ORIGIN TIME HR	MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	DI KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
JUL	4	6	4	40.3	61	21.9	146	40.8	27.2	2.9	28	8	53	32	0.59	0.4	0.9	A	23	1	0.7	293	4	0.5	127	86	1.6
	4	9	2	35.1	60	28.7	147	18.8	29.5	2.4	29	11	80	46	0.72	0.4	0.4	A	81	8	0.5	346	15	0.7	198	72	0.8
	8	10	16	11.0	61	15.0	146	46.3	21.2	2.5	27	12	42	24	0.51	0.3	0.7	A	17	4	0.6	286	10	0.4	128	79	1.3
	10	5	7	11.6	60	59.9	147	18.9	23.4	2.2	25	7	84	18	0.47	0.5	0.9	A	194	10	0.9	286	12	0.5	65	74	1.7
	10	14	56	57.6	60	59.2	147	14.1	21.4	2.1	25	7	46	14	0.51	0.5	0.9	A	5	2	0.9	274	9	0.6	107	81	1.7
	13	9	0	4.9	61	2.0	147	4.7	14.3	2.8	26	16	62	16	0.50	0.4	0.5	A	15	6	0.7	283	16	0.4	125	73	1.0
	13	17	2	52.7	61	40.9	147	2.3	28.9	2.1	17	12	139	23	0.77	0.6	0.7	A	115	19	0.7	213	23	1.1	349	60	1.5
	14	0	4	59.6	61	0.6	147	12.3	23.3	1.9	22	14	65	15	0.57	0.3	0.6	A	217	2	0.6	308	10	0.4	116	80	1.0
	17	5	51	27.7	60	26.9	144	54.8	20.0	0.8	11	7	181	19	0.44	1.0	1.1	A	114	16	0.9	12	35	1.4	224	50	2.5
	17	11	59	34.1	61	50.1	147	3.8	27.7	2.1	28	17	141	14	0.80	0.6	0.8	A	94	1	0.6	184	24	1.1	2	66	1.6
	20	19	35	49.5	60	31.7	144	53.0	26.7	1.0A	6	5	151	18	0.25	3.0	2.1	C	116	11	0.7	213	34	6.8	11	54	1.3
	21	16	25	28.0	61	0.8	147	17.7	30.0	1.9	21	16	67	18	0.64	0.3	0.4	A	105	1	0.4	15	14	0.6	199	76	0.7
	21	16	33	52.8	61	0.2	147	17.7	28.3	1.9	21	16	67	17	0.70	0.3	0.4	A	96	2	0.4	6	3	0.6	220	86	0.8
	23	22	40	19.4	61	4.6	145	53.9	2.2	0.8A	7	6	164	24	0.33	1.0	16.5	D	261	0	0.8	146	1	1.6	351	65	28.1
	25	13	58	43.0	61	1.2	147	14.1	21.4	2.1	23	4	44	17	0.40	0.5	1.1	A	15	0	0.9	285	12	0.6	105	78	2.0
	26	16	24	46.9	61	30.3	146	38.4	29.2	2.9	32	8	69	38	0.64	0.4	0.5	A	113	4	0.5	23	12	0.8	221	77	1.0
	28	4	10	41.1	60	43.6	147	2.6	29.0	2.5	33	16	55	18	0.59	0.4	0.5	A	281	6	0.6	12	12	0.8	165	77	0.9
	29	10	34	38.5	60	17.3	144	36.2	1.4	0.9	7	3	231	12	0.68	1.8	2.6	B	112	10	1.0	205	18	3.0	354	69	5.1
	29	10	37	14.1	61	15.0	146	51.8	26.5	2.8	29	18	46	27	0.60	0.4	0.8	A	293	1	0.5	23	7	0.7	195	83	1.4
	31	15	6	13.4	60	57.4	147	8.5	25.2	2.2	31	17	44	8	0.69	0.4	0.5	A	291	4	0.3	21	7	0.7	171	82	0.9
AUG	1	20	46	11.4	61	8.8	146	28.0	16.0	1.0	11	2	123	8	0.34	0.7	1.4	B	42	5	0.7	311	9	1.3	161	80	2.6
	2	4	50	34.0	60	45.9	146	53.1	16.5	2.8	34	11	44	16	0.48	0.5	0.7	A	285	4	0.5	195	7	0.8	45	82	1.4
	6	12	20	9.7	61	33.8	146	20.4	30.3	2.3	29	7	86	48	0.60	0.5	0.6	A	116	13	0.7	210	17	0.9	350	68	1.1
	7	1	37	49.8	61	10.8	145	37.2	26.2	2.3	33	16	56	16	0.79	0.3	0.4	A	6	2	0.5	97	4	0.4	250	85	0.7
	7	5	32	49.5	60	29.0	145	21.0	18.0	2.4	34	10	66	10	0.61	0.3	0.5	A	194	2	0.6	103	18	0.5	290	72	1.0
	7	5	54	25.6	60	27.0	145	20.1	19.2	1.3	12	4	206	12	0.64	1.4	0.8	B	173	2	2.6	83	15	0.9	270	75	1.5
	10	13	4	54.1	60	27.0	145	8.3	17.2	1.0	13	7	183	10	0.66	0.9	0.9	A	113	17	0.9	214	31	1.7	359	54	1.8
	11	15	18	25.0	60	15.6	145	12.0	15.9	0.8	6	5	279	31	0.20	2.2	1.4	B	22	21	4.4	123	25	1.4	257	56	2.5
	11	15	50	44.0	61	0.9	147	17.1	28.5	2.3	29	13	83	18	0.65	0.5	0.5	A	103	5	0.5	10	33	0.9	201	57	1.0
	11	19	44	48.2	60	58.2	147	15.1	30.0	2.1	25	12	100	13	0.51	0.5	0.5	A	97	4	0.5	4	34	1.0	193	56	0.9
	16	0	13	25.9	60	33.8	144	54.5	16.8	0.6	8	3	112	11	0.36	0.7	0.7	A	141	31	0.9	261	37	1.5	25	36	1.2
	25	9	13	23.4	60	30.5	145	9.8	20.8	1.9	24	8	114	4	0.54	0.5	0.6	A	113	5	0.7	21	29	0.9	212	61	1.2
	26	6	13	35.1	60	33.3	145	9.3	28.3	0.7	11	9	114	4	0.47	0.5	0.6	A	109	4	0.7	18	14	0.9	215	75	1.2
	26	8	42	26.5	60	30.1	145	8.8	13.8	0.6	5	4	169	5	0.49	1.2	0.8	A	99	23	0.7	355	28	2.4	222	52	1.3
	26	12	36	6.0	60	37.8	145	1.4	28.8	1.4	13	7	79	10	0.33	0.5	0.7	A	103	19	0.7	5	22	0.8	230	60	1.5
	26	14	3	52.4	60	59.3	147	16.5	27.8	2.1	24	7	97	16	0.92	0.5	0.7	A	6	8	1.0	274	11	0.5	131	76	1.3
	27	23	23	20.3	60	21.2	145	9.6	10.5	0.6A	5	3	261	20	0.41	1.9	1.8	B	140	18	1.2	261	38	3.2	34	40	3.7
	28	21	13	7.9	61	27.8	146	39.1	30.5	2.1	29	10	66	39	0.74	0.4	0.4	A	99	1	0.4	189	10	0.7	3	80	0.8
	29	13	21	9.4	60	57.9	147	9.0	15.1	2.2	33	8	44	9	0.79	0.4	0.7	A	189	2	0.7	280	11	0.4	89	79	1.3
	29	23	57	36.4	60	15.2	146	57.4	15.3	2.1	29	11	59	30	0.57	0.4	0.7	A	218	2	0.5	308	6	0.7	110	84	1.2
	30	1	8	47.7	61	38.8	147	0.4	27.6	2.1	28	15	80	27	0.65	0.4	0.7	A	104	3	0.6	195	10	0.8	358	80	1.4
	31	3	25	35.8	60	30.7	145	7.7	15.2	0.6	9	5	168	5	0.39	1.1	0.9	A	231	30	2.3	115	37	1.1	348	38	1.6
	31	22	40	59.6	60	24.7	147	37.6	28.1	2.2	28	11	159	61	0.57	0.7	0.8	A	264	5	0.6	171	27	1.2	4	62	1.7
SEP	3	13	16	52.3	61	25.4	145	58.5	36.3	2.5	32	8	58	8	0.60	0.4	0.4	A	340	3	0.8	261	26	0.6	76	62	0.7
	4	9	13	52.3	60	39.8	145	19.8	29.9	0.7	15	9	85	16	0.41	0.5	0.6	A	135	10	0.6	261	41	1.1	37	37	0.8
	6	14	8	25.6	61	38.0	147	1.3	26.8	2.1	30	9	76	28	0.57	0.5	0.7	A	277	2	0.5	186	7	0.9	23	83	1.3
	7	21	50	49.8	61	28.5	146	22.0	23.2	2.3	33	10	77	24	0.61	0.4	0.9	A	282	5	0.6	13	6	0.7	153	82	1.7
	10	15	6	55.0	61	30.4	146	21.9	20.4	2.2	33	8	80	24	0.69	0.4	0.8	A	125	1	0.5	35	2	0.7	242	88	1.4
	10	16	42	25.3	60	29.6	145	16.0	14.5	0.6	16	4	152	6	0.40	0.6	0.6	A	119	7	0.8	26	22	1.1	226	67	1.0
	11	3	16	42.6	60	56.5	147	30.3	29.9	2.0	32	12	50	24	0.46	0.4	0.5	A	109	5	0.5	201	20	0.8	6	69	1.0
	18	13	22	3.8	60	29.1	145	26.3	13.3	0.1	4	2	267	14	0.07	2.1	1.8	B	34	24	2.8	146	39	4.7	281	41	1.7

1984 VALDEZ AREA EARTHQUAKES

1984	ORIGIN TIME HR	MN	SEC	LAT N DEG MIN	LONG W DEG MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
SEP 18	22	32	31.8	61 31.0	146 31.7	26.8	2.1	31	9	74	33	0.56	0.3	0.8	A	298	0	0.5	208	8	0.6	28	82	1.6
19	19	51	5.6	61 18.5	146 26.4	24.1	2.3	35	10	47	21	0.65	0.4	0.6	A	276	5	0.4	8	19	0.7	172	70	1.1
20	4	17	25.7	60 15.0	145 54.5	13.9	4.2	40	6	82	34	0.61	0.4	0.6	A	276	1	0.6	186	10	0.8	12	80	1.1
			5.5 MB 5.2 MS					FELT (IV) AT CORDOVA, ANCHORAGE AND SUTTON; (III) AT CHITINA, CHUGIAK, PALMER, SEWARD AND VALDEZ; AND (II) AT EAGLE RIVER.																
20	4	28	4.8	60 17.0	145 54.9	11.7	3.9	41	8	79	31	0.71	0.4	0.6	A	195	3	0.8	104	5	0.6	316	84	1.1
			5.1 MB 4.7 MS					FELT (IV) AT CORDOVA AND (III) AT ANCHORAGE, CHITINA, PALMER, SEWARD, AND VALDEZ.																
23	4	1	2.8	61 13.6	145 22.0	25.9	2.8	40	8	53	2	0.67	0.4	0.5	A	31	0	0.7	301	2	0.6	121	88	0.9
23	12	42	47.7	60 30.3	144 42.1	15.8	0.8	15	9	101	13	0.44	0.8	0.7	A	108	24	0.6	358	37	0.9	223	43	1.8
24	5	58	18.9	60 44.1	147 31.0	35.2	2.3	32	13	58	28	0.46	0.5	0.4	A	97	10	0.5	195	43	0.9	357	45	0.8
24	8	24	52.7	60 40.2	145 2.7	24.3	0.7A	8	5	135	10	0.43	1.0	1.1	A	8	9	1.2	105	37	1.6	267	52	2.2
24	18	58	13.0	60 22.2	145 7.9	6.7	0.6	7	3	206	19	0.48	1.6	2.9	C	121	1	1.3	211	8	2.9	24	82	5.4
25	17	35	18.6	61 23.4	146 30.6	22.0	2.0	27	18	111	30	0.71	0.4	0.6	A	273	8	0.5	5	10	0.7	145	77	1.1
26	6	40	17.5	60 32.0	145 19.2	13.4	1.3	16	6	160	6	0.40	0.6	0.6	A	281	10	0.8	182	40	1.3	22	48	1.0
27	11	51	58.5	60 57.8	147 15.9	17.2	2.1	32	11	86	13	0.49	0.4	0.5	A	184	3	0.8	275	12	0.4	80	78	1.0
30	10	10	27.6	61 19.5	146 39.0	21.3	2.0	29	17	48	27	0.69	0.3	0.6	A	21	2	0.5	290	9	0.3	123	81	1.1
30	10	51	12.1	61 18.8	146 39.0	21.8	2.1	32	19	47	27	0.69	0.2	0.5	A	4	5	0.4	274	9	0.3	123	80	1.0
OCT 1	21	39	12.4	60 58.6	146 57.9	26.5	2.2	31	15	55	13	0.58	0.4	0.7	A	8	3	0.7	278	6	0.5	125	83	1.4
3	7	14	34.8	61 31.3	146 27.6	25.7	2.5	32	8	77	29	0.85	0.4	0.8	A	18	2	0.8	288	4	0.5	135	86	1.5
3	7	16	0.0	61 32.5	146 21.7	35.7	2.1	25	9	83	24	0.59	0.4	0.4	A	261	16	0.6	155	33	0.7	12	51	0.9
11	10	8	48.9	61 33.1	146 20.5	26.6	2.1	37	9	85	23	0.60	0.4	0.9	A	292	6	0.5	201	6	0.8	67	81	1.7
14	10	19	49.4	60 59.1	147 13.7	18.3	2.5	39	10	45	10	0.49	0.4	0.6	A	189	4	0.7	280	12	0.4	81	77	1.1
15	0	51	53.0	60 59.2	147 13.4	21.3	2.1	35	17	45	9	0.50	0.4	0.6	A	190	5	0.8	281	13	0.4	79	76	1.2
15	7	48	24.5	61 6.6	146 30.5	9.2	0.7	5	3	136	6	0.10	5.8	3.5	C	81	12	1.4	144	32	10.8	331	48	2.6
15	18	40	51.8	60 57.8	146 44.7	1.3	2.4	36	8	39	15	0.63	0.4	0.7	A	4	1	0.7	274	4	0.5	108	86	1.4
16	5	1	36.7	61 9.1	146 33.8	15.4	0.0A	6	5	178	10	0.48	1.2	1.2	A	223	8	0.6	321	44	1.2	125	45	2.9
17	5	20	4.4	60 29.1	144 56.3	14.4	1.0A	10	7	166	16	0.64	1.2	1.0	A	109	15	0.6	209	35	2.6	0	51	1.5
18	6	57	43.9	60 24.1	144 54.3	20.5	1.7	25	13	150	13	0.75	0.4	0.5	A	114	14	0.5	209	21	0.8	353	64	0.9
18	7	37	57.8	61 9.4	146 35.0	15.0	0.5A	6	5	181	11	0.36	2.2	1.7	B	37	3	0.8	129	37	5.0	303	53	1.3
23	9	54	13.2	61 3.6	146 19.8	14.9	2.3	37	11	37	8	0.67	0.2	0.4	A	305	6	0.4	214	7	0.4	75	81	0.7
24	12	9	35.1	60 58.0	147 17.5	30.8	2.1	35	21	46	14	0.55	0.3	0.3	A	286	6	0.3	190	44	0.5	22	45	0.6
24	14	14	23.7	60 20.2	145 4.9	24.2	1.0	12	6	209	23	0.45	1.2	1.0	A	121	2	1.0	30	30	2.4	214	60	1.6
25	2	35	10.8	60 56.4	146 50.6	35.9	2.2	31	24	53	15	0.81	0.3	0.2	A	186	9	0.6	279	17	0.4	69	71	0.5
28	15	0	42.3	61 32.0	147 22.9	23.2	2.5	28	14	85	34	0.61	0.4	0.7	A	19	1	0.8	288	11	0.4	114	79	1.3
30	23	0	55.2	60 44.8	147 24.5	6.8	2.0	34	14	55	23	0.71	0.3	0.6	A	183	9	0.6	276	19	0.4	69	69	1.2
NOV 1	4	52	21.3	60 32.5	146 32.8	20.9	2.1	30	19	72	16	0.71	0.3	0.6	A	355	1	0.6	265	6	0.5	94	84	1.1
2	1	46	35.9	60 28.7	145 1.6	16.4	2.6	34	11	62	12	0.50	0.5	0.6	A	9	14	0.9	103	17	0.5	241	68	1.1
4	9	27	4.3	60 23.1	147 52.6	23.8	2.9	39	10	91	57	0.55	0.4	0.7	A	349	3	0.7	261	8	0.5	100	81	1.2
4	19	15	51.9	60 32.7	144 47.2	16.5	0.5	10	8	138	13	0.34	0.7	1.0	A	31	6	1.3	123	23	0.8	287	66	2.0
11	5	45	42.9	61 20.5	147 19.4	25.8	3.3	29	13	77	30	0.48	0.4	0.6	A	294	0	0.5	204	7	0.8	24	83	1.2
13	0	50	31.5	60 31.8	144 45.5	27.5	0.6A	7	6	107	16	0.38	1.2	0.7	A	355	31	1.2	261	35	2.2	124	44	0.9
13	8	58	50.3	60 27.5	147 44.1	18.5	2.4	35	14	80	55	0.54	0.4	0.7	A	349	8	0.7	261	14	0.4	109	74	1.3
15	13	53	34.2	61 7.5	146 29.5	15.4	0.6A	6	6	166	8	0.34	1.2	0.7	A	32	3	0.6	123	18	2.3	293	72	1.3
15	23	51	3.8	60 37.5	144 40.0	0.2	1.1A	8	7	106	31	0.44	1.0	3.0	C	33	7	1.5	125	12	0.6	273	76	5.9
17	23	36	28.8	61 27.8	147 59.5	27.1	2.2	26	14	65	25	0.49	0.4	0.7	A	25	0	0.8	115	2	0.5	295	88	1.2
18	11	24	54.4	61 37.9	146 33.1	26.1	2.3	34	19	81	37	0.71	0.4	0.9	A	287	2	0.5	197	7	0.7	33	83	1.7
18	18	21	34.3	61 6.3	146 31.9	17.7	-0.1	3	2	204	5	0.31	25.0	18.3	D	145	10	99.0	261	27	1.9	40	52	3.1
21	4	3	34.7	60 26.9	147 47.3	19.4	2.0	25	6	101	55	0.41	0.7	1.0	A	262	13	0.8	169	13	1.3	36	71	2.0
25	19	29	29.5	61 24.7	146 22.5	25.4	2.1	33	14	61	26	0.60	0.3	0.7	A	349	4	0.5	261	10	0.4	101	79	1.3
25	21	27	31.2	61 23.8	146 25.4	25.5	2.2	36	15	59	29	0.56	0.3	0.5	A	186	2	0.5	276	5	0.4	74	85	0.9

1984 VALDEZ AREA EARTHQUAKES

1984		ORIGIN HR	TIME MN	SEC	LAT N DEG	MIN	LONG W DEG	MIN	DEPTH KM	MAG	NP	NS	GAP DEG	D1 KM	RMS SEC	SEH KM	SEZ KM	Q	AZ1 DEG	DIP1 DEG	SE1 KM	AZ2 DEG	DIP2 DEG	SE2 KM	AZ3 DEG	DIP3 DEG	SE3 KM
NOV	26	10	32	54.0	60	28.5	144	46.1	12.4	1.3	17	9	113	11	0.46	0.6	0.7	A	124	11	0.8	26	36	1.0	228	52	1.5
	27	3	21	0.8	60	58.3	147	59.8	27.9	1.6	21	12	93	22	0.42	0.3	0.9	A	105	1	0.5	195	7	0.6	7	83	1.6
DEC	4	14	56	36.0	61	10.1	146	33.6	18.0	0.9A	8	7	156	12	0.50	1.0	1.0	A	261	3	0.6	136	38	2.2	354	40	1.1
	5	3	8	22.6	61	27.9	146	33.8	22.4	2.0	29	22	69	34	0.59	0.3	0.7	A	11	2	0.5	280	11	0.4	111	79	1.3
	7	15	39	24.6	60	41.1	145	16.5	0.0	0.2	4	3	189	17	0.85	1.5	25.0	D	20	0	1.4	290	0	2.9	0	90	99.0
	10	8	33	8.7	60	26.3	145	9.9	18.1	1.5	17	8	165	11	0.81	0.9	0.7	A	264	3	0.8	174	8	1.7	14	81	1.3
	11	1	28	5.3	61	20.1	147	7.3	22.8	2.0	28	16	85	31	0.43	0.4	0.9	A	27	2	0.8	297	9	0.5	129	81	1.6
	17	6	46	31.2	60	35.3	147	22.1	28.3	2.6	36	17	60	36	0.71	0.3	0.4	A	278	1	0.4	8	3	0.5	170	87	0.8
	17	13	53	33.3	60	27.8	145	9.7	18.5	2.0	30	15	101	8	0.82	0.4	0.4	A	81	5	0.5	346	33	0.8	179	56	0.8
	17	15	37	31.4	61	11.7	146	33.4	6.2	0.2A	3	3	226	14	0.11	3.9	10.7	D	16	10	1.1	283	17	1.8	135	70	21.3
	20	0	43	39.1	61	55.4	147	23.9	40.2	2.3	25	12	158	11	0.62	0.7	1.0	A	85	5	0.6	176	16	1.2	338	73	2.0
	20	23	22	53.6	61	9.6	146	16.7	16.1	0.4A	5	4	154	4	0.16	2.2	0.9	B	33	11	0.8	301	11	4.2	167	74	1.6
	20	23	24	7.3	61	9.3	146	16.0	18.2	0.4	4	5	183	4	0.20	2.0	1.5	B	35	5	0.8	302	34	4.4	132	56	1.8
	22	10	27	41.2	61	3.2	146	31.2	13.8	2.8	35	14	35	2	0.71	0.3	0.5	A	181	4	0.5	271	12	0.4	73	77	1.0
	23	4	40	15.5	61	36.1	146	31.2	27.2	2.0	30	18	78	34	0.70	0.5	0.9	A	289	2	0.6	199	7	0.9	35	83	1.8
	26	3	28	47.9	60	27.3	145	13.7	14.5	0.1A	3	3	264	9	0.34	2.2	2.8	C	46	13	3.6	144	32	2.5	297	55	6.0
	28	5	36	7.0	61	8.5	146	26.2	15.5	0.6	12	6	88	6	0.84	0.7	0.6	A	225	3	0.6	134	33	1.4	320	57	0.9
	29	4	32	57.0	61	20.4	146	58.9	21.5	2.2	32	14	46	33	0.44	0.3	0.9	A	209	2	0.6	300	7	0.5	103	83	1.7
	30	18	29	9.8	60	26.5	145	18.0	9.9	0.8	8	4	229	12	0.45	2.5	1.2	B	261	6	1.1	347	19	4.8	154	70	1.7