Title
SEISMICITY OF THE SOUTHEASTERN GEYSERS

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Seismicity of the Southeastern Geysers

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LBL-26679

SEISMICITY OF THE SOUTHEASTERN GEYSERS

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Prepared For
Geysers Geothermal Company
Santa Rosa, California

February 1989

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INTRODUCTION

The interest in seismicity in areas of geothermal development has increased because of a correspondence between microearthquakes and steam extraction for electricity. It is clear that the number of earthquakes increases, and perhaps also their size, with the onset of production, but the exact inducing mechanism is still puzzling (e.g., Oppenheimer, 1986; Allis, 1982). The southeastern section of the steam field, called the South Geysers in this report, is a relatively new production area and few studies of the induced seismicity have been made there.

Areas of high heat flow typically have high microseismicity rates, and conventional, routine processing is very time-consuming and expensive. The Automated Seismic Processor (ASP) was developed to alleviate these difficulties. It is a field-based, low-cost, low-maintenance system which detects and locates earthquakes, then routinely calculates source and statistical parameters, all in almost-real time. It has been shown to be both reliable and effective in the processing of large data sets in geothermal areas as well as in aftershock and other microearthquake studies. A detailed description of ASP operations can be found in McEvilly & Majer, 1982 and Majer & McEvilly, 1985.

The ASP system was installed on May 27, 1987 in the "Chateau Seismique", connected to the temporary seismic array installed and operated by Utah Geophysical, Inc. in the South Geysers area. The array consisted of ten stations, nine single-component vertical and one three-component, covering an area approximately five by eight km (Fig. 1).

ASP analyzed the seismic activity of the South Geysers for 5 months, from June 10 to November 10. A total of 3837 events were detected during that time and 1754 were of sufficient size and quality to be located by ASP. Of these, 1131 earthquakes were found to have epicenters within the map boundaries of interest to Geysers Geothermal Company. These boundaries were chosen to be 1776000 to 1808000 feet East

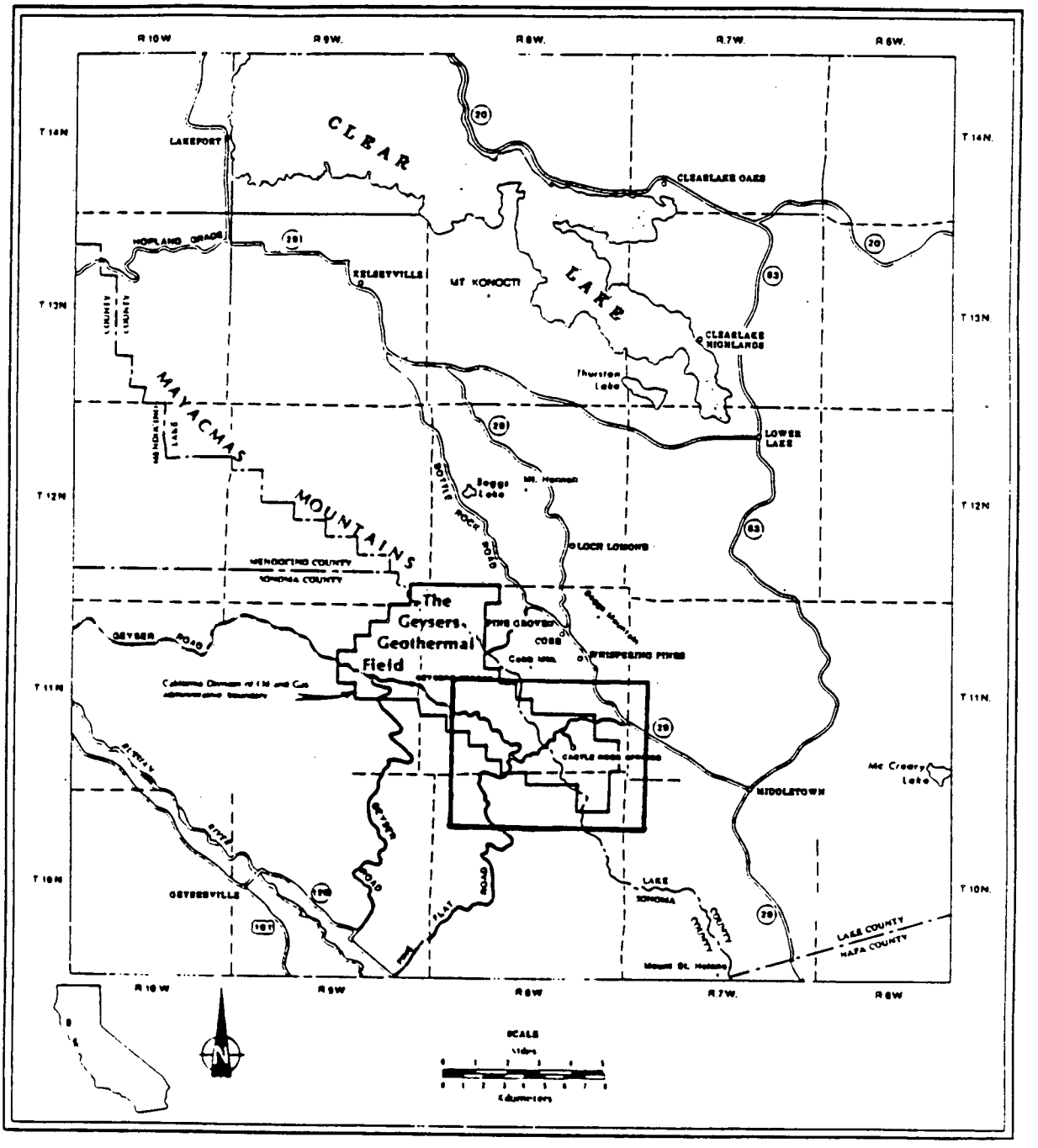


FIGURE 1: Location of The Geysers geothermal field and study area. (after Stockton, 1981)

and 390000 to 414000 feet North, in Lambert Coordinates (38.735 to 38.801 deg Lat and 122.674 to 122.785 deg Long). The data set is continuous except for a three-day period from September 9 to 11, when data was lost due to a misread tape, and the first four days of November, because of a technical problem.

SOURCE PARAMETERS

Method of Calculations.

Fourier transforms for spectral analysis (frequency domain) are calculated by ASP for both the P and S wave portions of recordings made from each station. From these, the long-period spectral level (Ω_o), corner frequency (f_o), and high-frequency roll-off are computed. The averaged source parameters of seismic moment (Mo), source radius (r), stress drop ($\delta\sigma$), and fault slip (u) of the event are then estimated using the formulas developed by Brune (1970, 1971):

$$Mo = 4\pi RdV^3\Omega$$

$$r = 2.34V/2\pi f_o$$

$$\delta\sigma = 7Mo/16r$$

$$u = Mo/\pi dV^2$$

in which R is the hypocentral distance, d is the density and V is the velocity.

The source parameters are listed in Appendix A in order of earthquake occurrence, along with the number of P-wave arrivals which were used in the analysis. This number of recordings is a measure of the quality of the parameters; they were computed from each trace's spectrum and then averaged. The least number of P-wave arrivals is 5, which is the minimum for calculation of hypocenters.

Only the computations from P spectra are listed in Appendix A; the S-wave picks on most events were few in number because few recordings met the quality standards. This was due to the fact that nine of the stations only recorded in the vertical direction, whereas most S-wave ground motion is in the horizontal direction.

Moment.

The seismic moment is the most direct measure we have of the strength, or size of an earthquake. It is taken from moment arms in physics, and represents the forces associated with slip along a fault plane with an equivalent system of torques. Since it is directly related to the source, it is also the best indicator of energy release. The

units are dyne-cm, or force times distance, which are units of work or energy. The seismic moment is also equal to the rigidity of the rock times the area ruptured times the average displacement during the rupture.

Besides being a better measure of earthquake size than magnitude, a major advantage of working with moments is that they can be summed for total moment (energy) release. The disadvantage is that the numbers are large and difficult to work with. Often the log of the moment is used instead, for individual earthquakes or sums.

The log of the moment for each event in this study is included in the event listing of Appendix B. The moments ranged from 2.7 X 10^{12} to 1.2 X 10^{20} dyne-cm for individual events. Also computed were the daily moment sums which are listed in Table 5 with daily earthquake counts, and are discussed in the section on temporal occurrence.

Magnitude.

The seismic moments (Mo) calculated by ASP were converted into magnitudes equivalent to the local, or Richter magnitude (M), using a formula empirically derived especially for the Geysers area (Majer & McEvilly, 1979):

$$\log(Mo) = 15.9 + 1.3M.$$

Magnitudes of the located events within the study area ranged from -2.6 to 3.2. Table 1 lists the total number of earthquakes with magnitudes in each half-magnitude interval. Most events (92%) have magnitudes between 0.5 and 2.0, with almost half falling in the range between 1.0 and 1.5.

Completeness of the data set in terms of lower magnitude level is empirically determined by plotting the entire set on a plot of log number of events greater than a given magnitude versus that magnitude. The points are regressed by a line with the equation:

$$\log(N) = a - bM$$

for the slope b, which is called the b-value. At some magnitude, there is significant

TABLE 1

EQ COUNTS IN MAGNITUDE INTERVALS

magn interval	no of eqs
# < -1.Ø	2
-1.Ø < # < -Ø.5	Ø
-Ø.5 < # < Ø.Ø	3
Ø.Ø < # < Ø.5	29
Ø.5 < # < 1.Ø	241
1.Ø < # < 1.5	521
1.5 < # < 2.Ø	281
2.Ø < # < 2.5	44
2.5 < # < 3.Ø	9
3.Ø < # < 3.5	1
3.5 < # < 4.Ø	Ø
4.Ø < #	Ø

departure from the line, which means that fewer earthquakes of that magnitude were recorded than would be expected. Thus the data set is considered complete down to that magnitude. The b-value plot for this study is shown in Figure 2. This set is complete down to magnitude 1.0.

The b-value thus obtained is 1.5. Regionally, the b-value averages around 0.8. The high value in the South Geysers means there were more small events and fewer large ones than expected overall in California, which is consistent with observations. Similarly high b-values in other areas of the Geysers have been seen (e.g., Ludwin and Bufe, 1980; Majer and McEvilly, 1979). Extrapolation of the line predicts a magnitude 4 event every 9 years and a magnitude 5 event every 270 years in the study area, assuming there is a large enough fault area available for slip.

Source Radius.

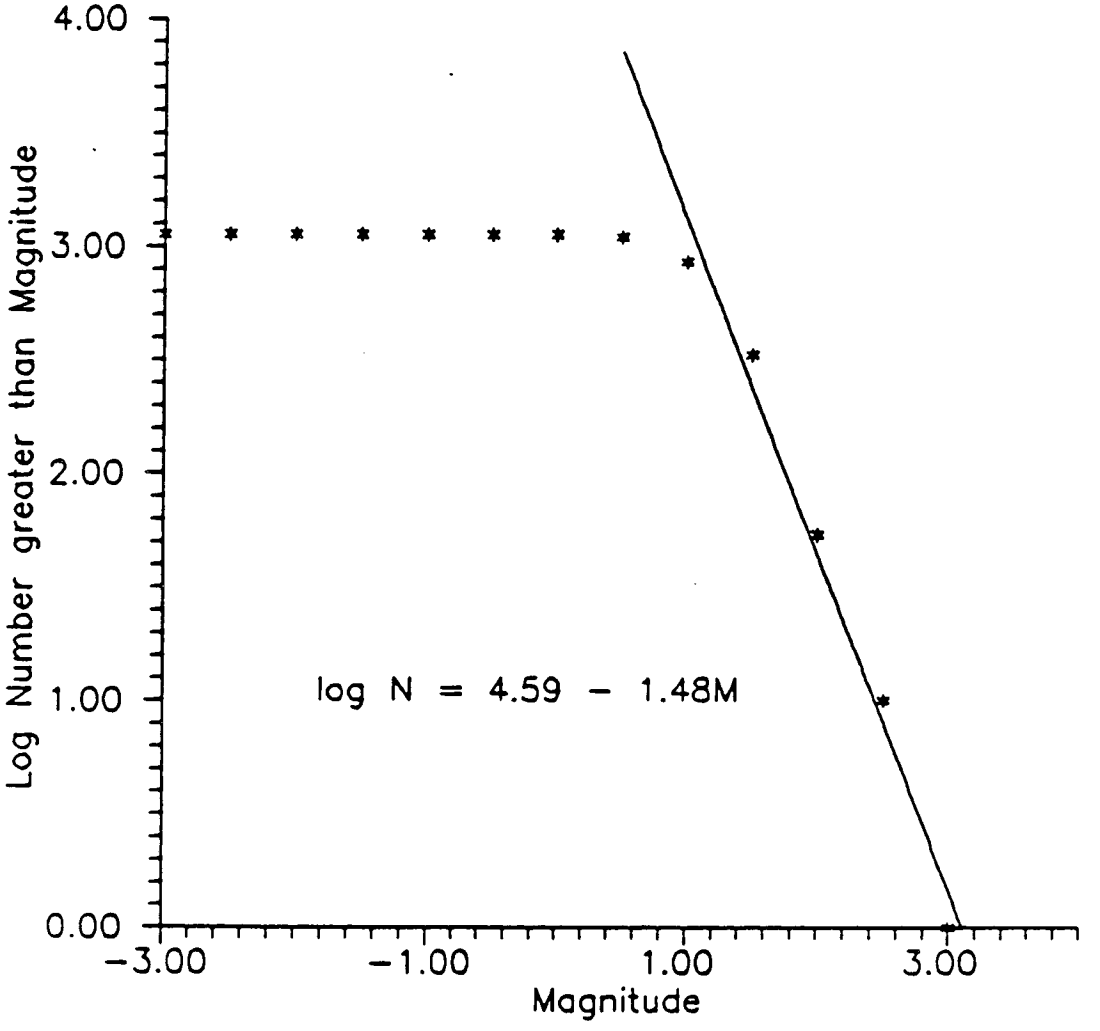
The source radius of an event is an estimation of the size of its rupture as approximated by a circle on a planar surface. This would seem to be a good approximation for small events which do not rupture the entire width of the seismogenic zone.

The event with the largest source radius within the study area was recorded on October 25. Its estimated circu-lar area had a radius of 483 meters (1585 ft). A few of the small events have radii that went to small negative numbers, which are obviously physically unreasonable, and can be considered to be small positive numbers within the error bounds of this type of analysis. The average rupture radius in the data set was 76.7 m (252 ft).

The radaii were converted to rupture areas and summed to find a total fracture area of 2.59×10^4 km^2 (2.79×10^8 kft^2). Doubling the radii gives an estimate of the total equivalent fault length of 173 km (567.2 kft). This measure, however, is more arbitrary because of varying fault width.

FIGURE 2

B-VALUE COMPUTATION



Stress Drop.

The stress drop is a measure of the change in shear stress on a fault due to an earthquake, i.e., the initial stress minus the final stress. The stress drops calculated for these events are in the range expected for microearthquakes, averaging 0.8 bars. The largest one was associated with an earthquake that occurred on October 24, and it is unusually high for the size of the event, measuring 13.8 bars. All others ranged from near 0 to 6.5 bars. The total stress relieved by these 1131 earthquakes is estimated to be 941 bars.

Displacement.

Displacement is the amount of movement on a fault plane by the sides moving past each other. In microearthquakes, displacements are very small, and those estimated here are no exception. They average 0.014 cm and range from near zero to 0.3 cm. The total displacement from the data set is 16.1 cm.

HYPOCENTER LOCATIONS

Method of Calculation.

ASP has a digital, triggered event detector which counts all events with accepted criteria and locates those which trigger a minimum number of stations and have P and S wave qualities above a minimum level. For a location to be made in this study, at least 5 stations had to trigger from an earthquake and each have a P-wave amplitude of at least 5 times the background noise. For S-wave picks to be used in the locations, their amplitudes had to exceed the noise by a factor of 8, and exceed the P wave amplitude by a factor of 3 as well. These strict conditions under which events were located ensured that only the best-recorded earthquakes were used. The automatic picking of wave arrivals with very good signal-to-noise ratios also eliminated the subjective bias which is often introduced by hand-picking these arrivals.

ASP calculates hypocenter locations using a non-linear, least-squares method with a velocity model comprised of one layer that has linear P and S wave velocity gradients, over a half-space with constant velocities. The velocities chosen for this study are presented in Table 2. All locations are listed in Appendix B in order of occurrence. The times are Universal Time; to convert to local time, subtract 7 hours during Daylight Savings and 8 hours during normal time. The hypocenter locations are in feet, Lambert Coordinates.

Qualities.

The earthquake locations are assigned a quality factor based on the standard error of the residuals in the location computations. Those chosen for this study are listed in Table 3 and the quality of each event included in the event listing in Appendix B.

TABLE 2: VELOCITY MODEL

	P wave	S wave
surface velocity	2.Ø km/s	1.7 km/s
gradient in layer	Ø.5 km/s/km	Ø.25 km/s/km
depth to interface	5.Ø km (-13,482 ft elevation)	
half-space velocity	5.Ø km/s	3.1 km/s

TABLE 3: LOCATION QUALITY FACTORS

km error of latitude & longitude (LE)	km error of depth (DE)	quality factor
Ø.Ø < LE ≤ Ø.1	Ø.Ø < DE ≤ 1.Ø	a
Ø.1 < LE ≤ Ø.5	1.Ø < DE ≤ 2.Ø	b
Ø.5 < LE ≤ 1.Ø	2.Ø < DE ≤ 5.Ø	c
1.Ø < LE	5.Ø < DE	d

Epicenter Distribution.

The distribution of all the earthquake epicenters located in the study area can be seen in Figure 3. The highest concentrations of events lie scattered in a band which trends northwest-southeast, with less dense regions in the northeast and southwest. Most of the events occurred in the northwestern portion of the array and further to the northwest outside the array. Another cluster is seen in the southern array area and a dearth of events separates the two main groups in an east-west stripe through the center of the array. The largest earthquake (M = 3.2) occurred in the southeast corner of the array in an otherwise sparse region, and several other relatively large events (M = 2.5-3.0) took place in the sparse region to the southwest.

The earthquakes are plotted for each four-week period and the last two-week period in Figures 4a-f. During the first period (6/10-7/7), the seismicity was distributed over the entire area, with a few small clusters in the northwest region outside the array. The second period (7/8-8/4) had fewer events in the northeast and southwest regions. There was a large cluster of activity just north-west of the array, and a small cluster at (1786 kft E, 404 kft N). During the third and fourth periods (Figs. 4c and 4d), mostly scattered seismicity was recorded, including the largest event in the southeast corner of the array and two other large events in the southwest corner of the region. The last 4-week period (Fig. 4e) has several distinct northwest-trending lineations extending through the array.

The distribution of these events was studied in relation to their sizes. Figures 5a-d are plots of all events in different magnitude ranges. From these plots it can be seen that up to M=2, the distribution within the array is similar for each magnitude range. Above that level, however, the events appear to be skewed to the west. Of the ten events with M>2.5, seven are located west of the array.

Figure 6 is a plot of only events with A, B, or C quality, which keeps the epicentral error within one km (3.28 kft). The pattern is much the same. Figure 7 is a plot of only A and B quality events, further refining the data set to events which have epicentral errors of less than 0.5 km (1.64 kft). Most of the largest events have been

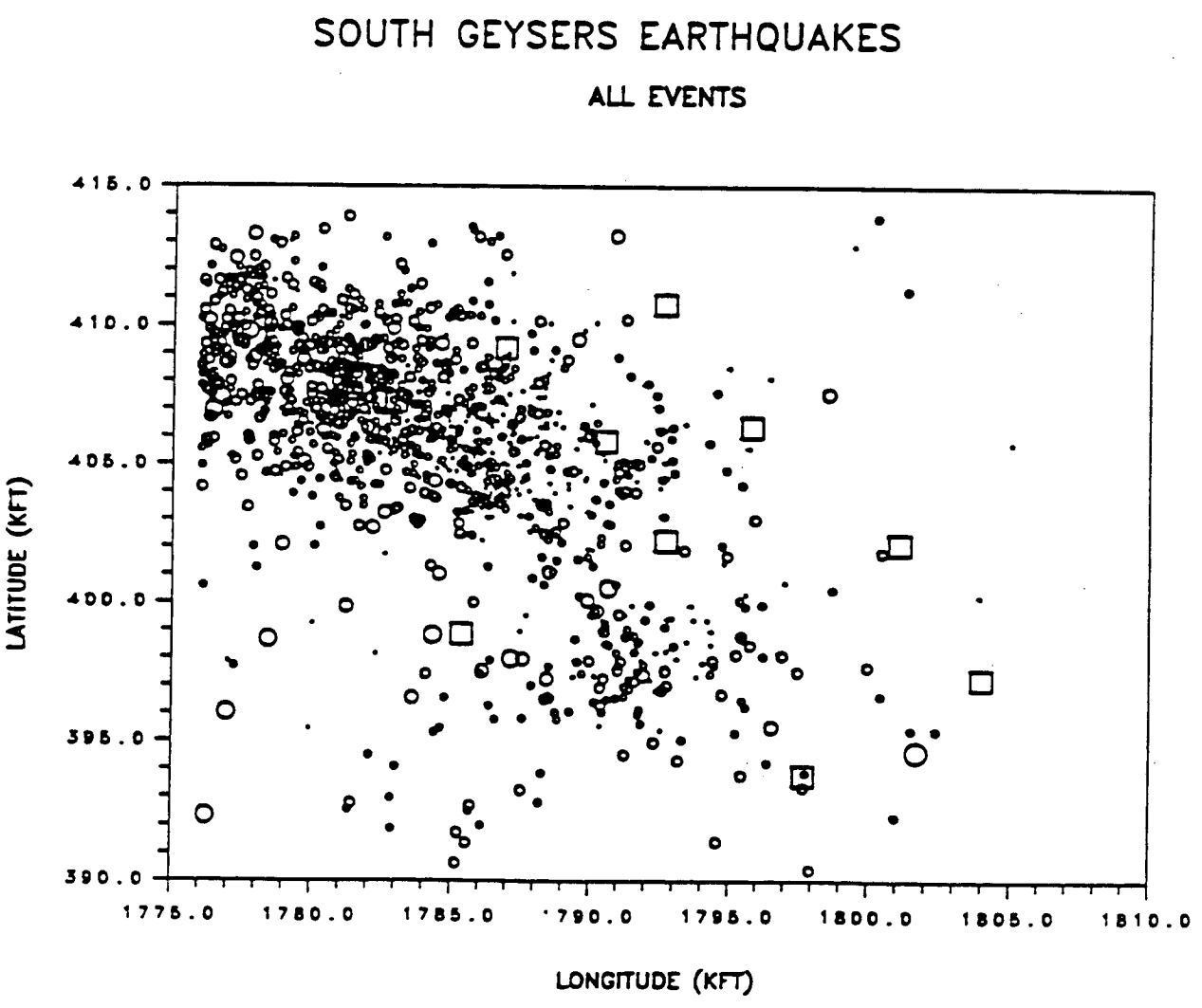

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 3

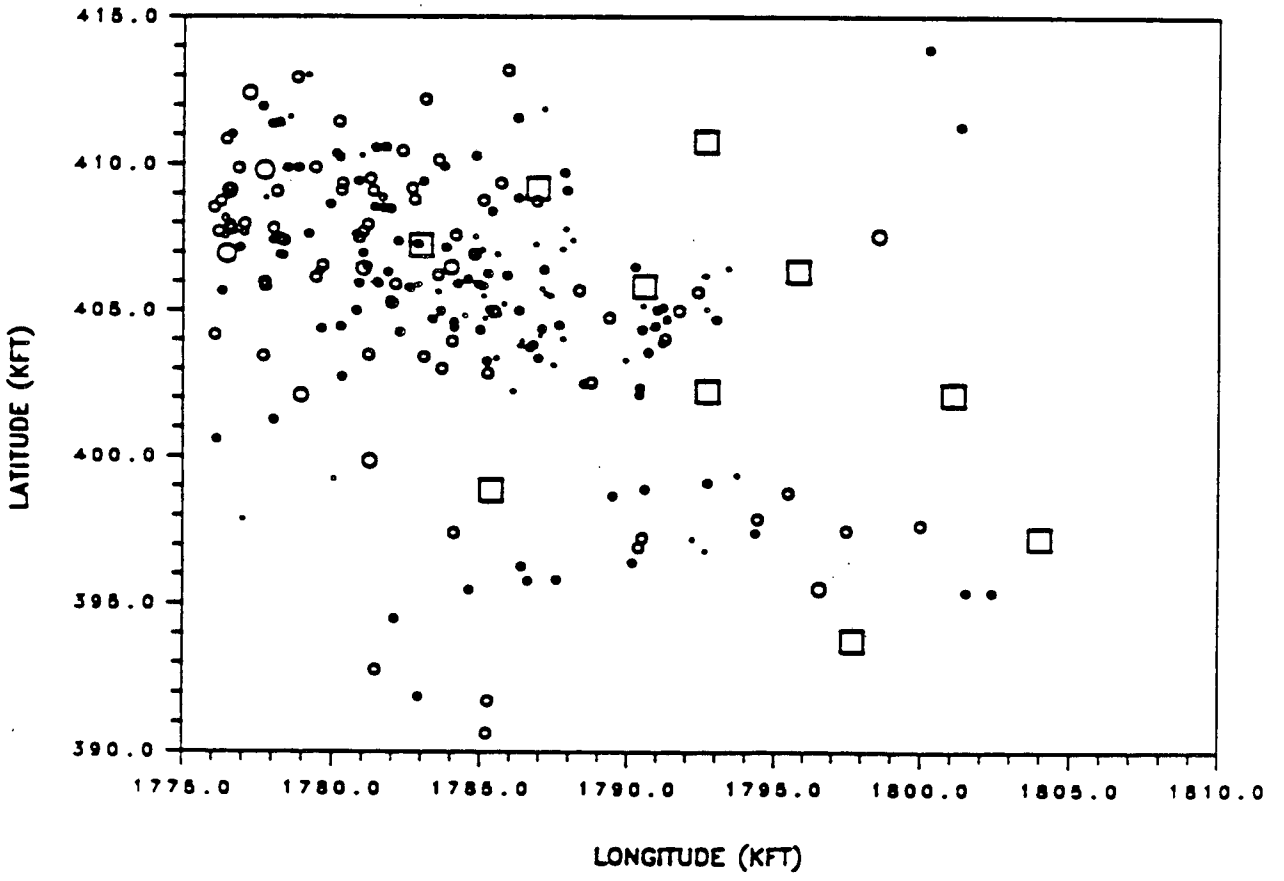

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS FROM 6/10 TO 7/7/87
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 4a

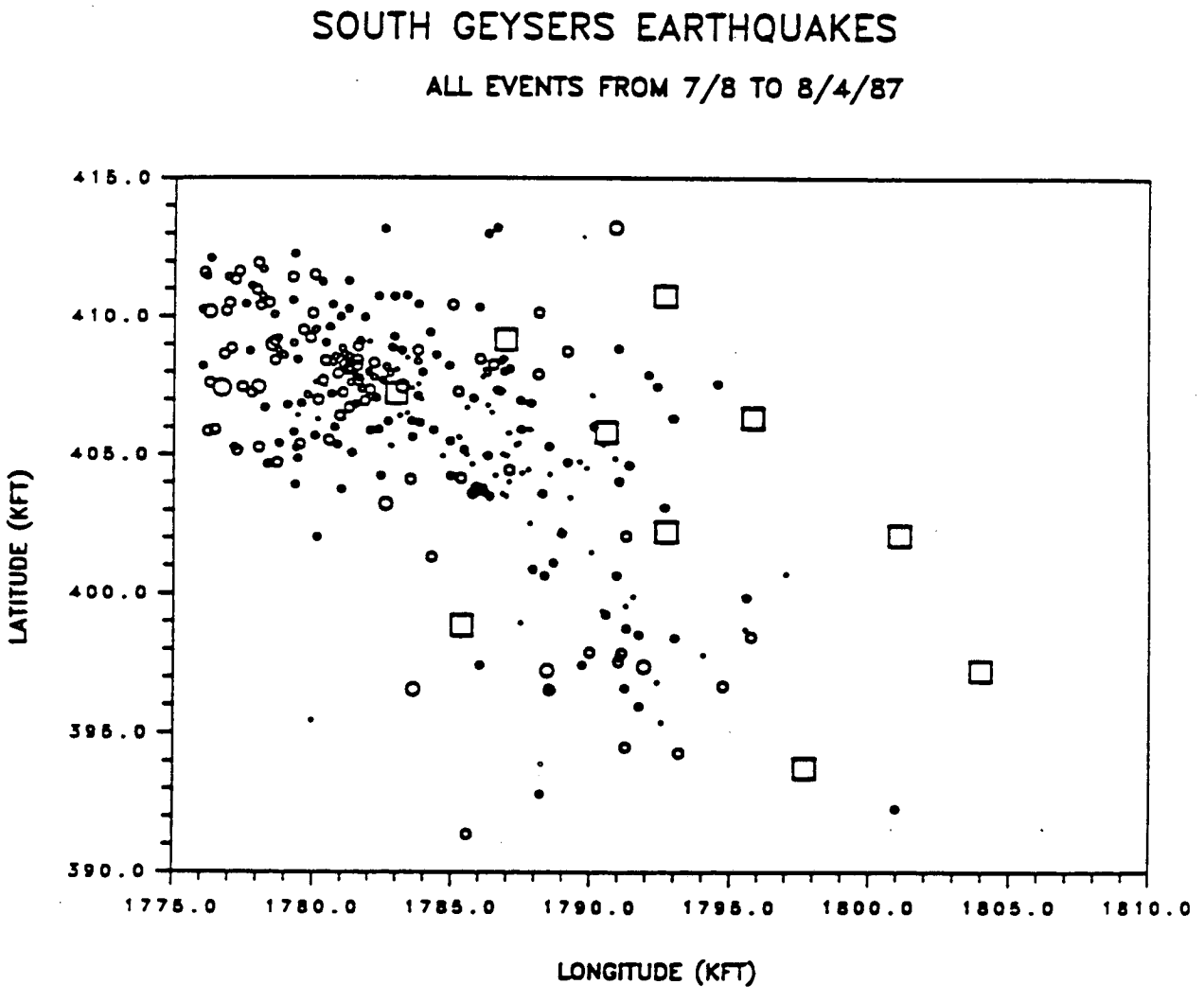

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS FROM 7/8 TO 8/4/87
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 4b

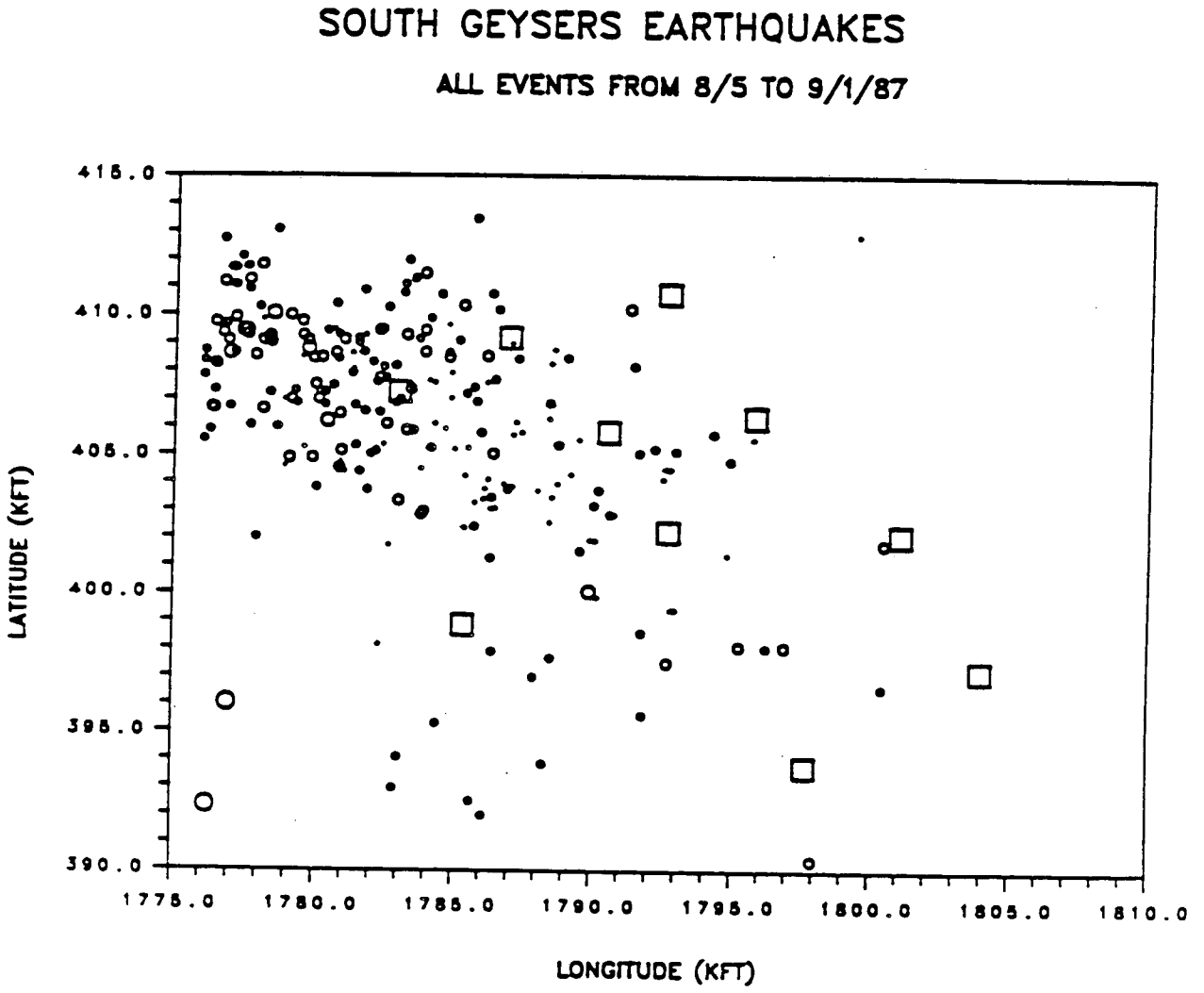

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS FROM 8/5 TO 9/1/87
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 4c

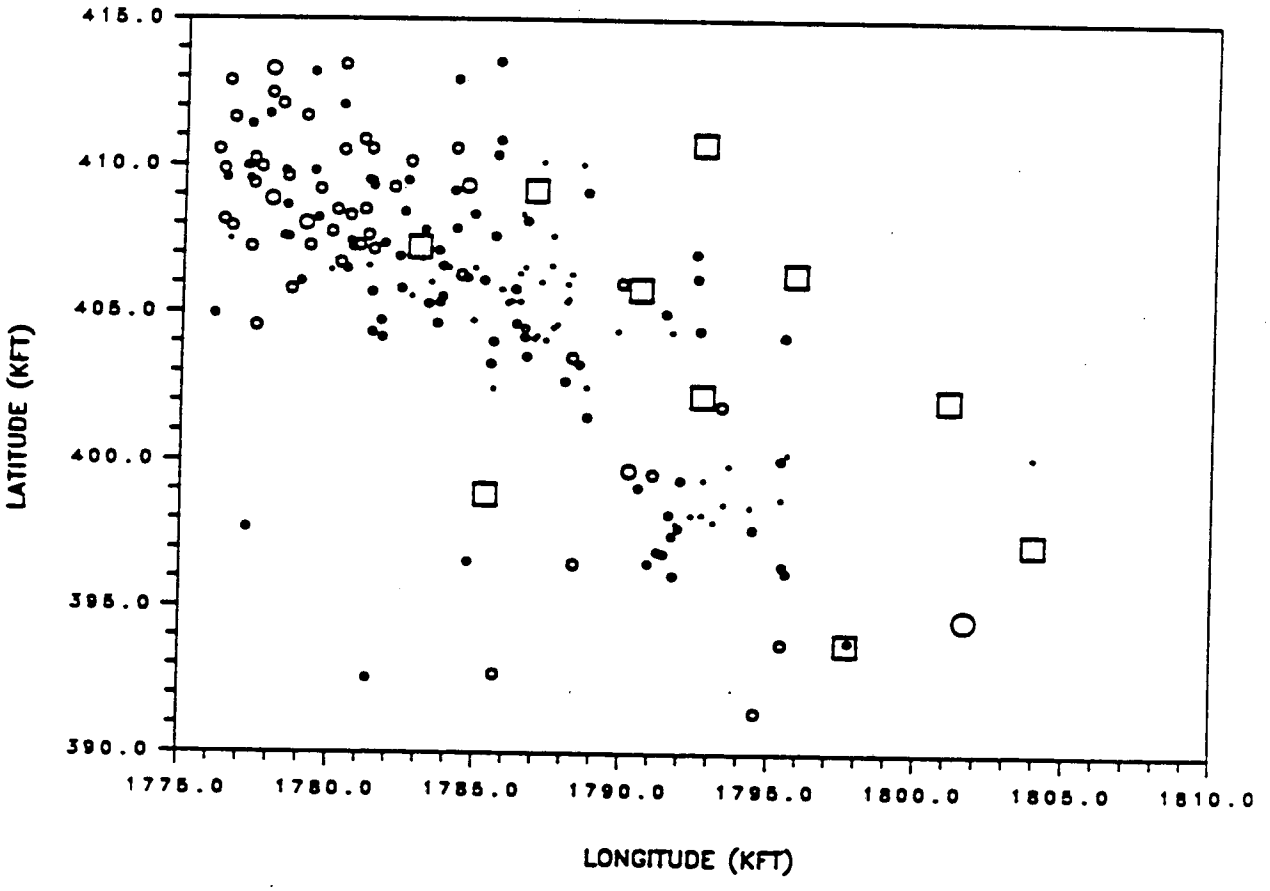

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS FROM 9/2 TO 9/29/87
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 4d

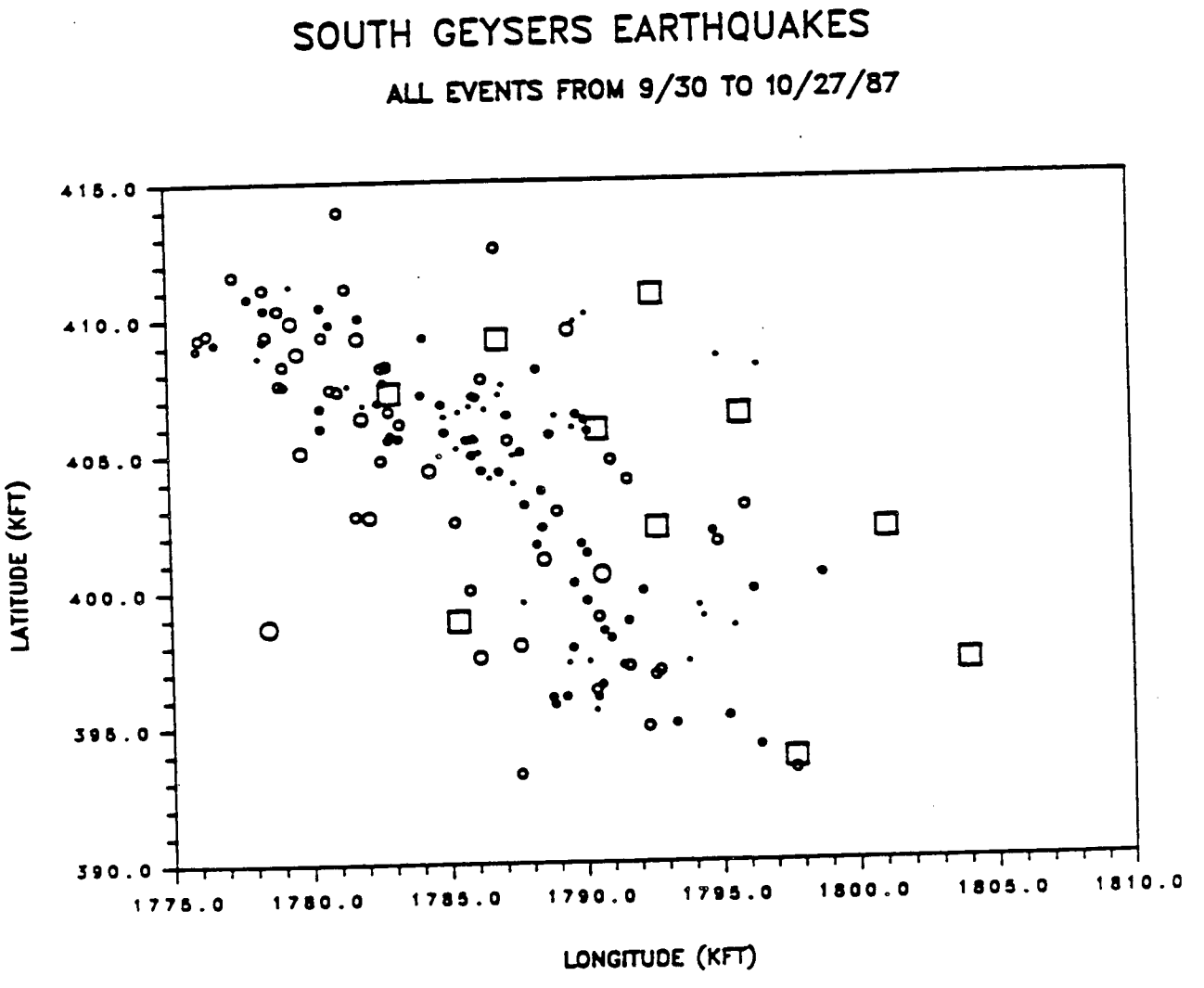

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS FROM 9/30 TO 10/27/87
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 4e

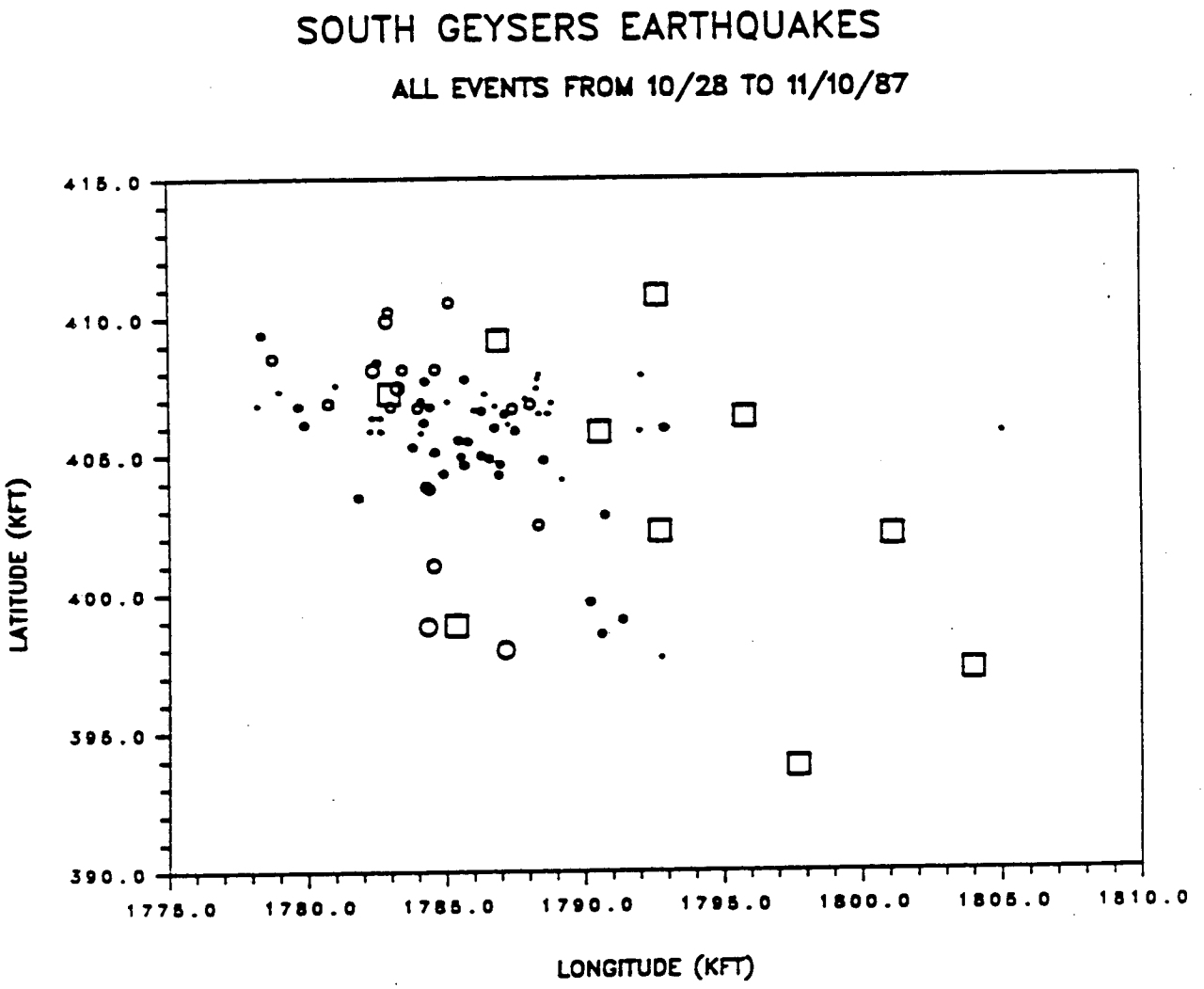

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS FROM 10/28 TO 11/10/87
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 4f

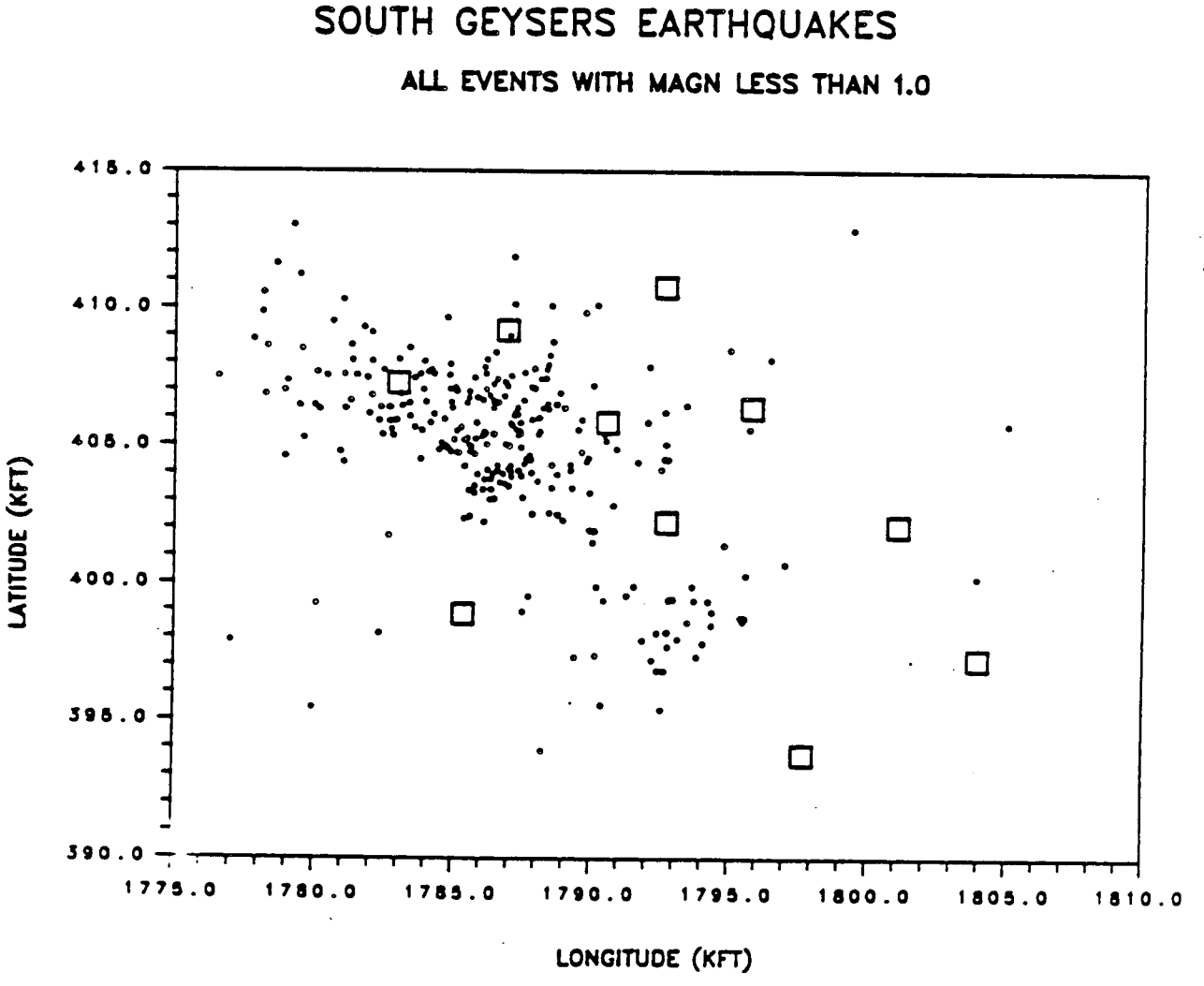

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS WITH MAGN LESS THAN 1.0
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)

FIGURE 5a

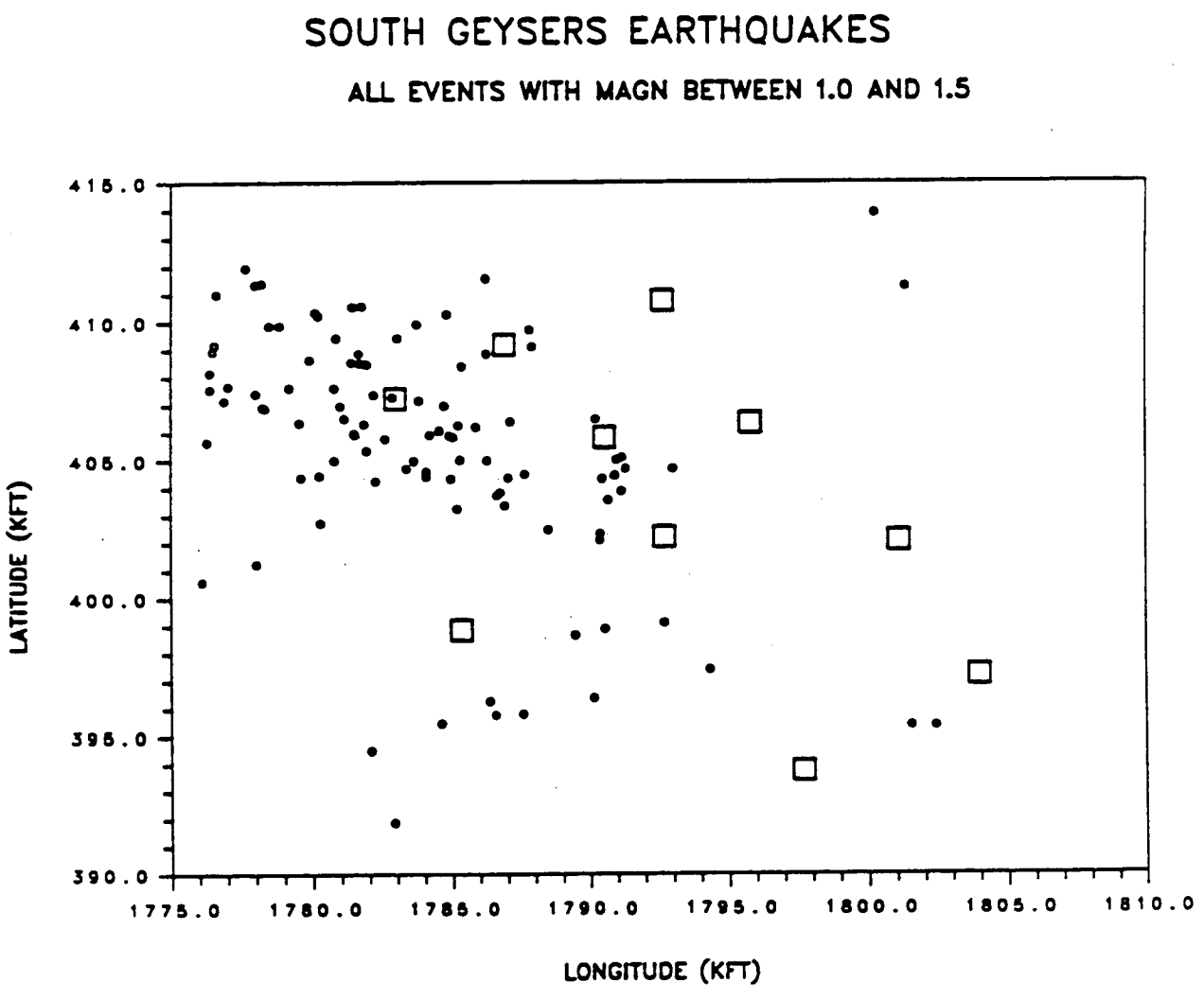

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS WITH MAGN BETWEEN 1.0 AND 1.5
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)

FIGURE 5b

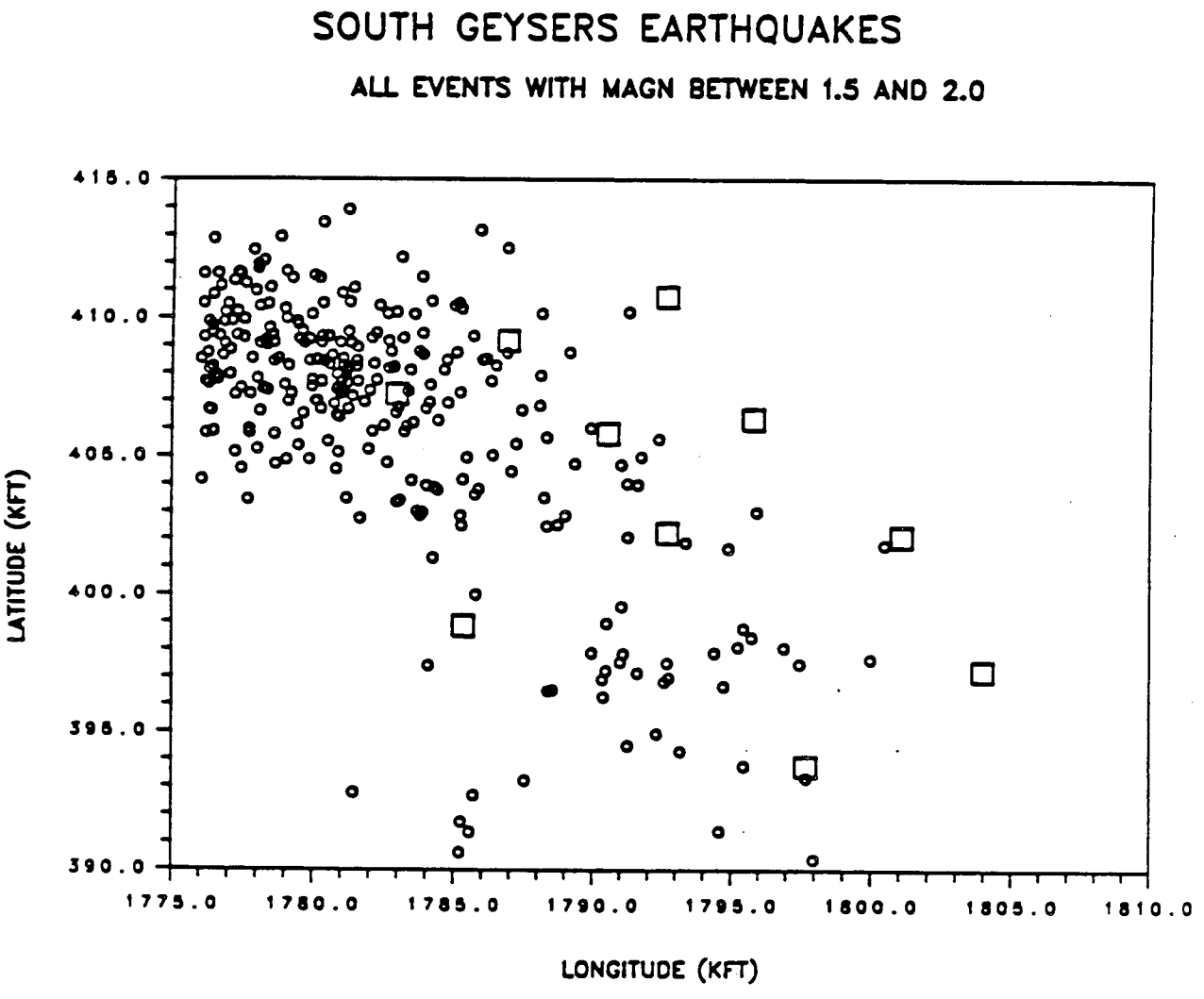

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS WITH MAGN BETWEEN 1.5 AND 2.0
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)

FIGURE 5c

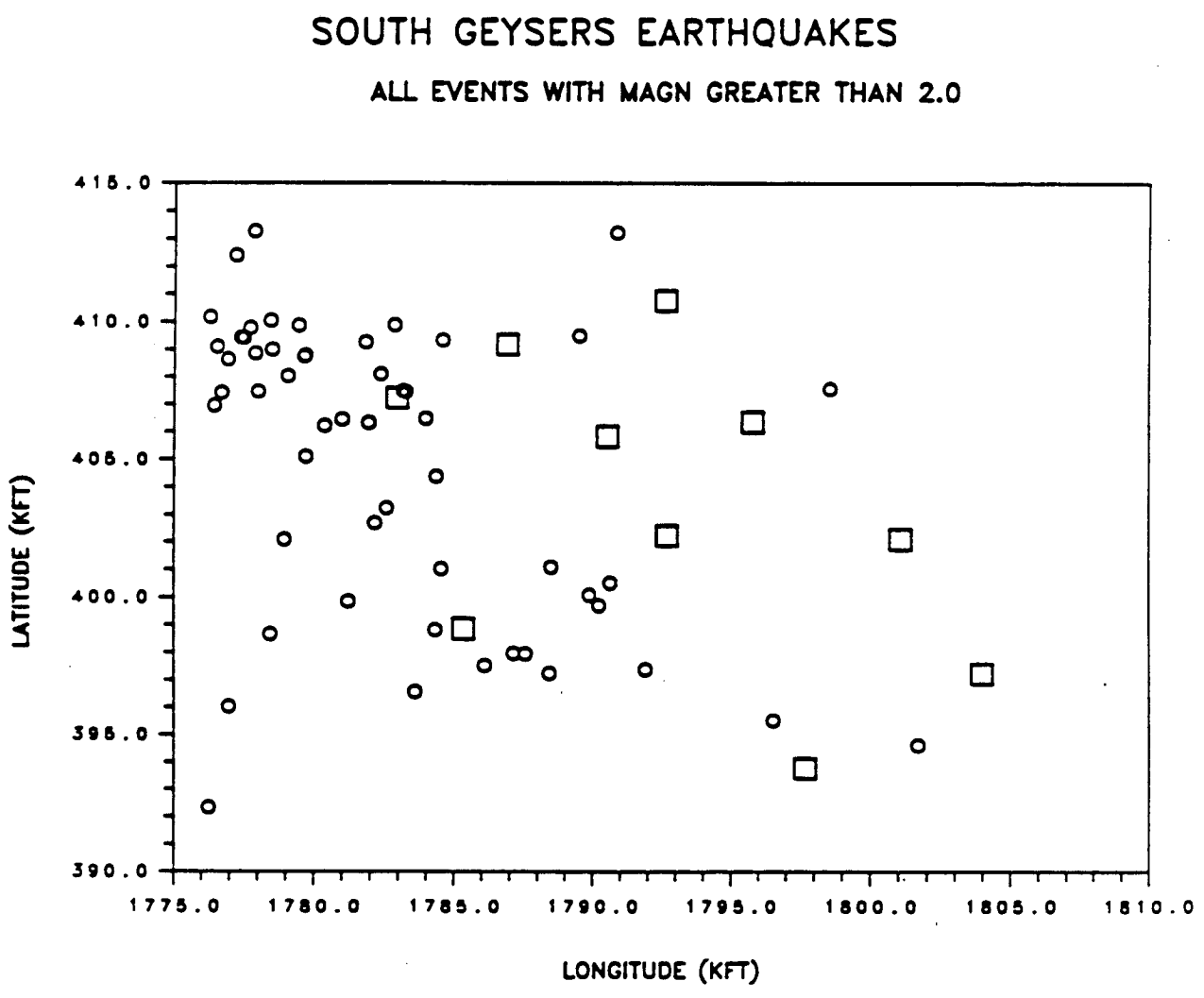

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS WITH MAGN GREATER THAN 2.0
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)

FIGURE 5d

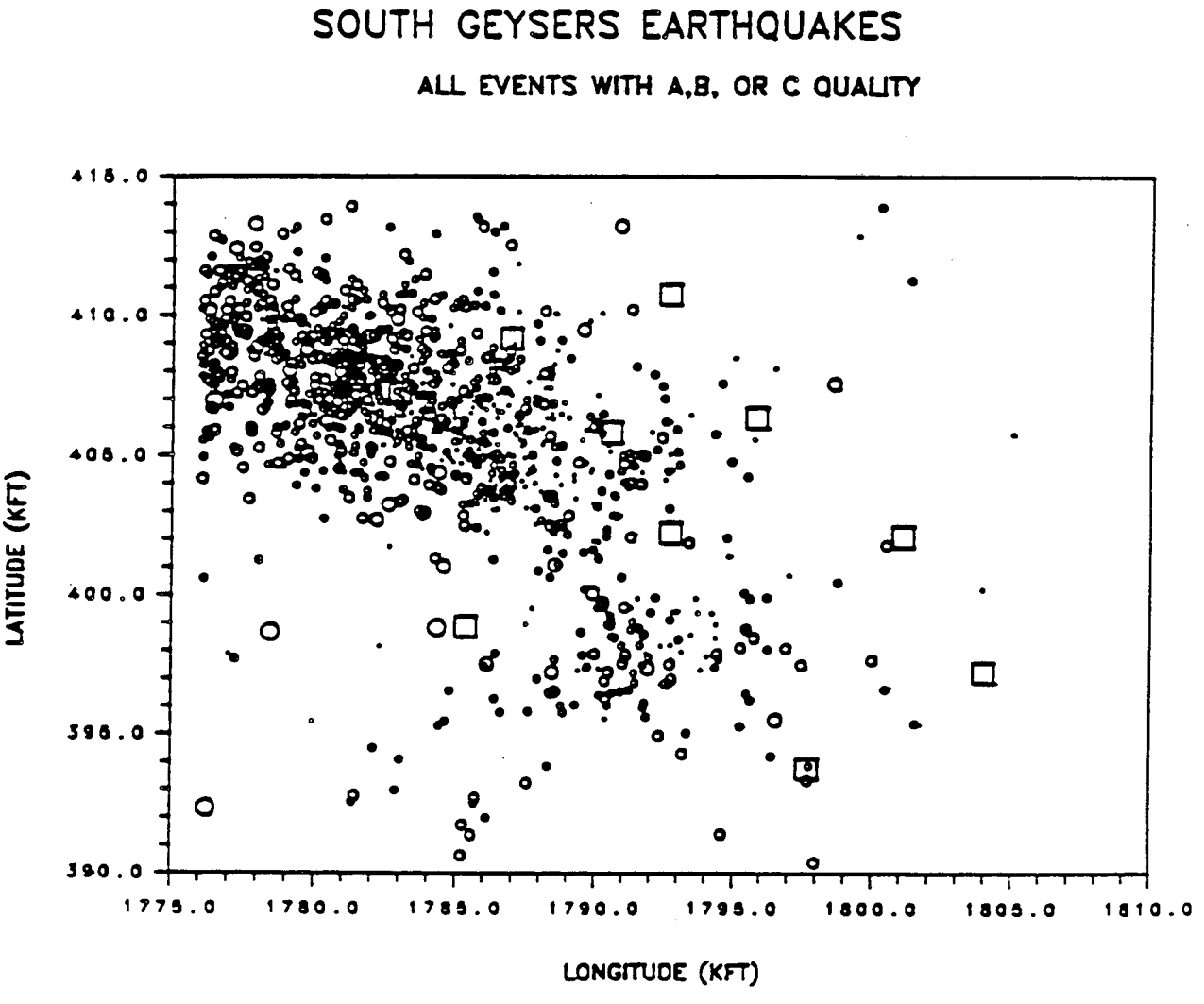

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS WITH A,B, OR C QUALITY
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 6

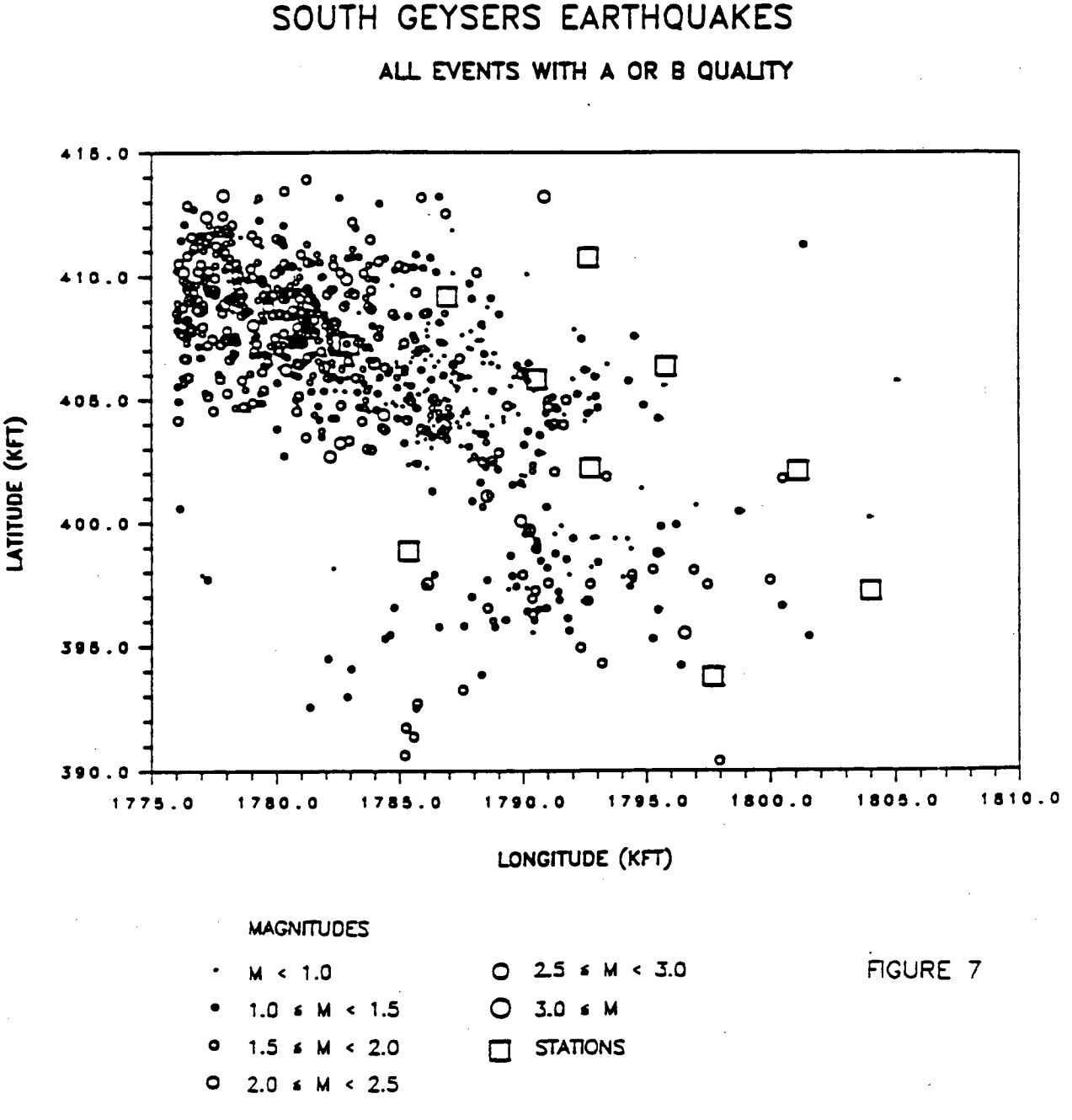

SOUTH GEYSERS EARTHQUAKES
ALL EVENTS WITH A OR B QUALITY
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 7

eliminated, and a striking northwest-trending boundary is apparent, which separates a more dense population to the southwest from a less dense region to the northeast. This boundary seems to continue into the southern array and connect with a group of events which form a linear pattern there. This feature corresponds rather well with the trace of the Sulphur Creek fault zone, which extends across the study area in a northwest to southeast direction, and is a major structural feature of the region. Lithologic or fracture differences, or changes in reservoir characteristics across the fault, could be investigated as possible causes of this seismic density boundary.

Correlation with Injection Wells.

In Figure 8 the injection well locations provided by Geysers Geothermal are plotted along with stations and quality A and B seismicity. There is no obvious spatial correlation between these wells and the earthquakes. If injection plays a role in the induction process it has been difficult to detect by spatial correlation (e.g., Eberhart-Phillips and Oppenheimer, 1984).

Depth Distribution.

Depths of foci generally have the largest errors in location because it is the third dimension that absorbs most of the problems caused by such things as an inaccurate velocity model or errors in time picks. The use of an automated picker minimizes the time errors due to human variation, but can introduce systematic errors. The velocity model chosen for this study may be slightly on the slow side compared with other studies, which would tend to pull earthquakes shallower, but this would again produce a systematic error so that the locations relative to each other are nonetheless expected to be very good. No one-dimensional velocity model accommodates the lateral variations in velocity and Poisson's ratio which undoubtedly exist in this area.

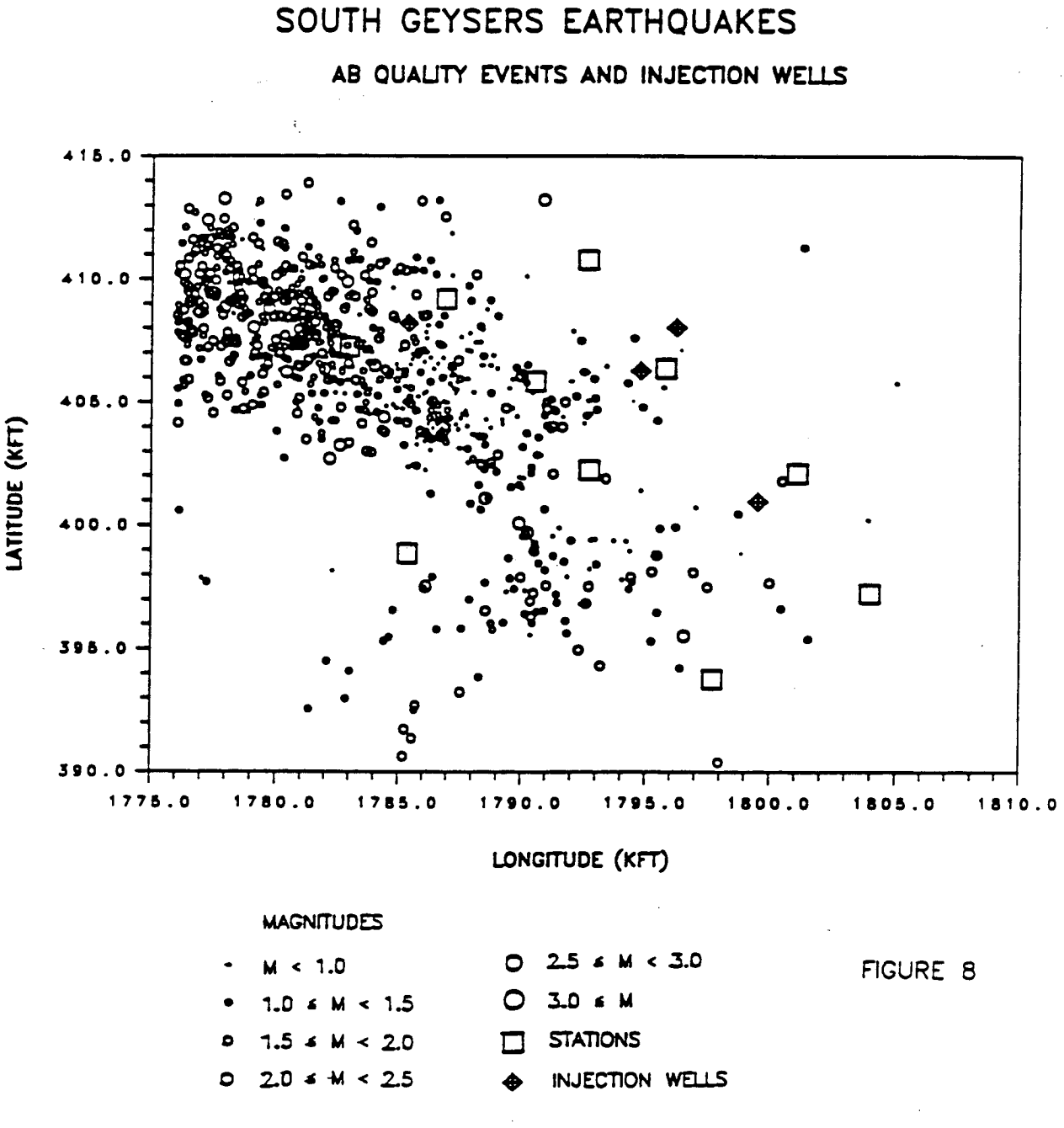

SOUTH GEYSERS EARTHQUAKES
AB QUALITY EVENTS AND INJECTION WELLS
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS
INJECTION WELLS

FIGURE 8

General changes in the distribution of events with depth are apparent in Figures 9a-d, for A and B quality events. All depths are in kft sea level elevation. The shallowest earthquakes occurred mostly in a loose cluster in the northwestern part of the array. As the depth increases, this group spreads out until, in the range -10 to -15 kft, there are very few events in that area, most of them surrounding it. Contrary to this pattern, the deepest group seems uniformly scattered.

The numbers of earthquakes with A or B quality in 5 kft elevation ranges are listed in Table 4. The seismic activity peaks in the range of -10 to -15 kft, and drops off quickly as the depth increases. Also listed are magnitude distributions in each depth range. The shallowest earthquakes, above 0 kft elevation, are all M<1.0, and from 0 to -5 kft, 74% fall in this magnitude range. The fraction of these small events decreases with each depth range until there are only 7% in the range -10 to -15 kft, and none deeper than 20 kft. It is to be expected that more small earthquakes will be recorded closer to the recording sites at the surface, and since this data set is complete only down to the M=1.0 level, this decrease with depth is not significant. However, there is a definite tendency for magnitudes to get larger with depth in the range for which the set is complete. There are no earthquakes between magnitude 1.0 and 1.5 at the shallowest level, increasing to about half in the three depth ranges from -5 to -20 kft, then decreasing markedly below that. Larger events are absent down to -5 kft, and increase steadily until 59% of the deepest events are between magnitude 1.5 and 2.0, and 24% are above magnitude 2.0. This difference in size between shallow and deeper events is significant and may, for example, be related to a change in mechanism, increasing size of fracture systems, or increasing apparent strength of the rock due to an increase in normal stress with depth.

The entire data set with qualities A, B, and C are plotted in cross-sections in north-south, east-west, north-east-southwest, and northwest-southeast directions in Figures 10a-d. Many events are located at -13.5 kft and few in the 2 kft just below. This is an artifact of the location algorithm and not a feature of the seismicity. The interface between the layer and the half-space in the velocity model is at that depth, and it is more stable to locate them just above than just below the interface. This is a

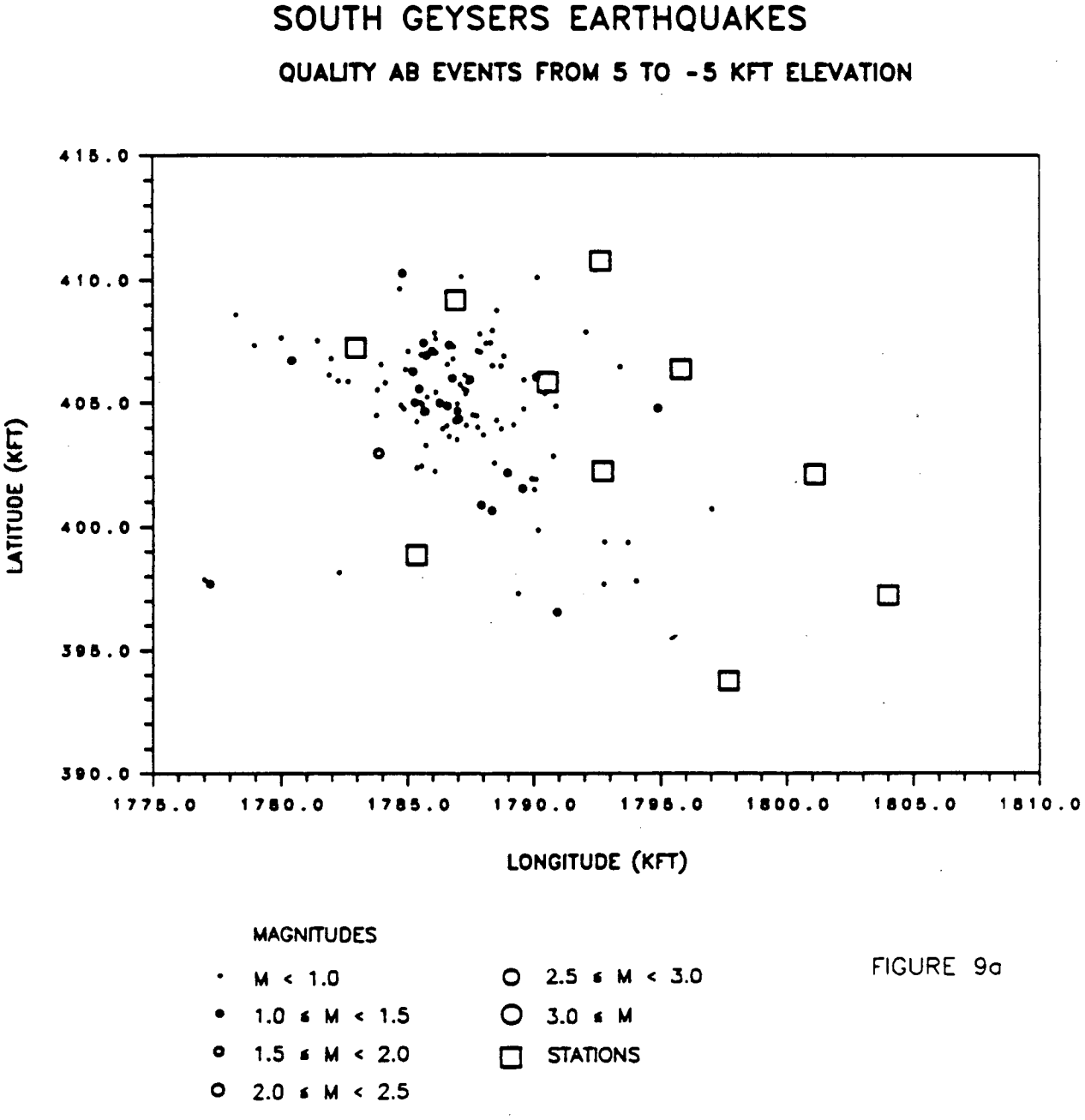

SOUTH GEYSERS EARTHQUAKES
QUALITY AB EVENTS FROM 5 TO -5 KFT ELEVATION
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 9a

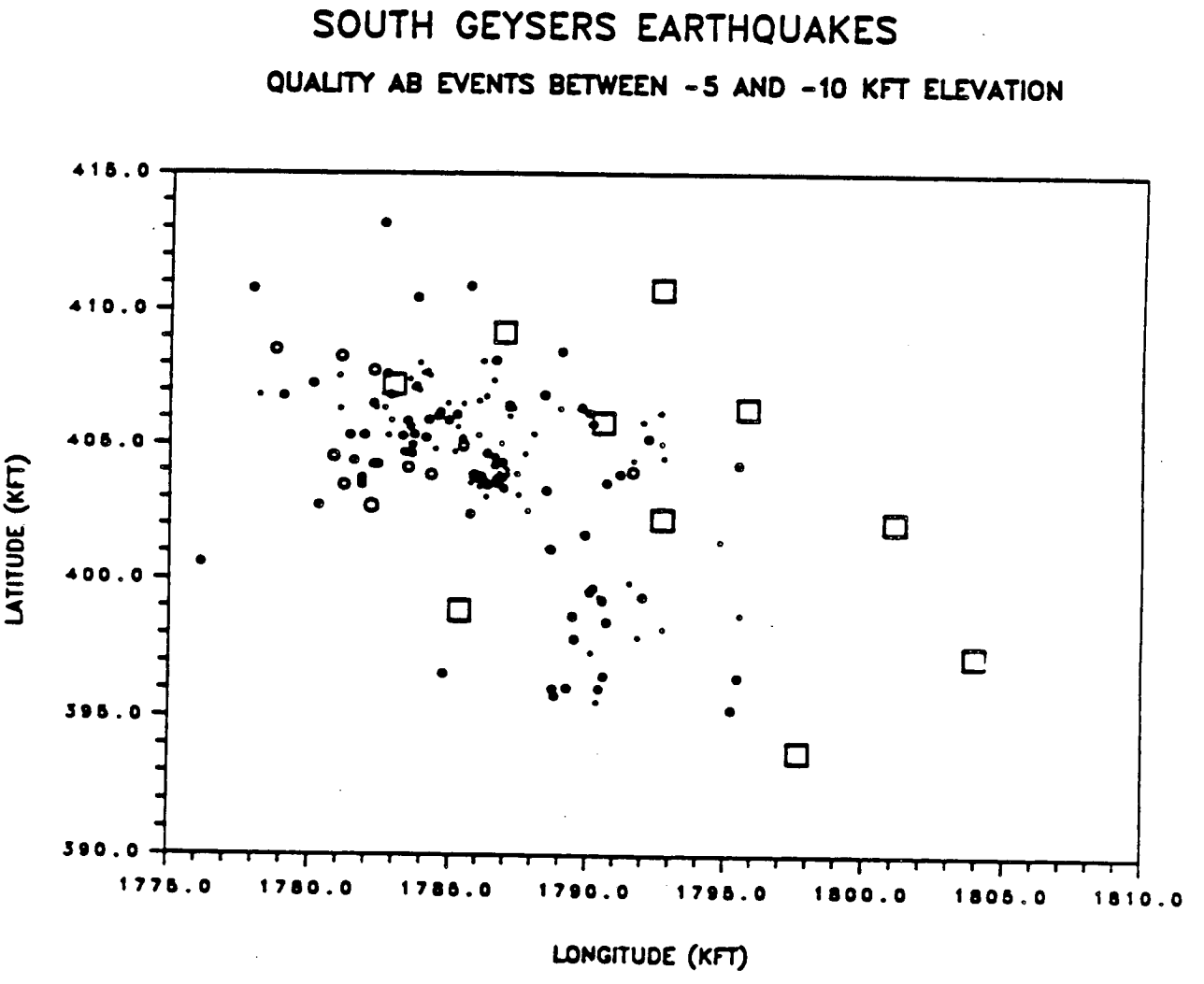

SOUTH GEYSERS EARTHQUAKES
QUALITY AB EVENTS BETWEEN -5 AND -10 KFT ELEVATION
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 9b

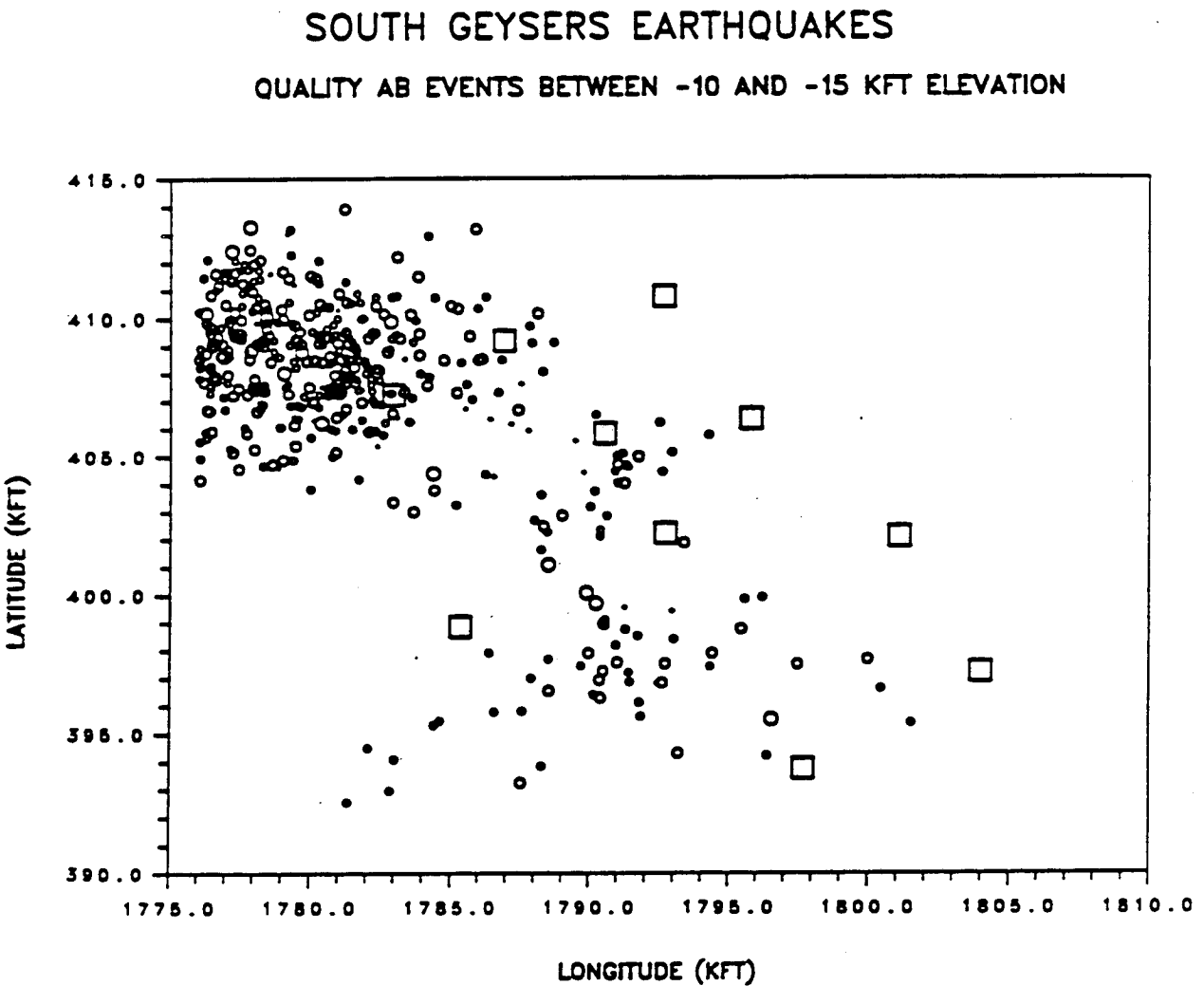

SOUTH GEYSERS EARTHQUAKES
QUALITY AB EVENTS BETWEEN -10 AND -15 KFT ELEVATION
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 9c

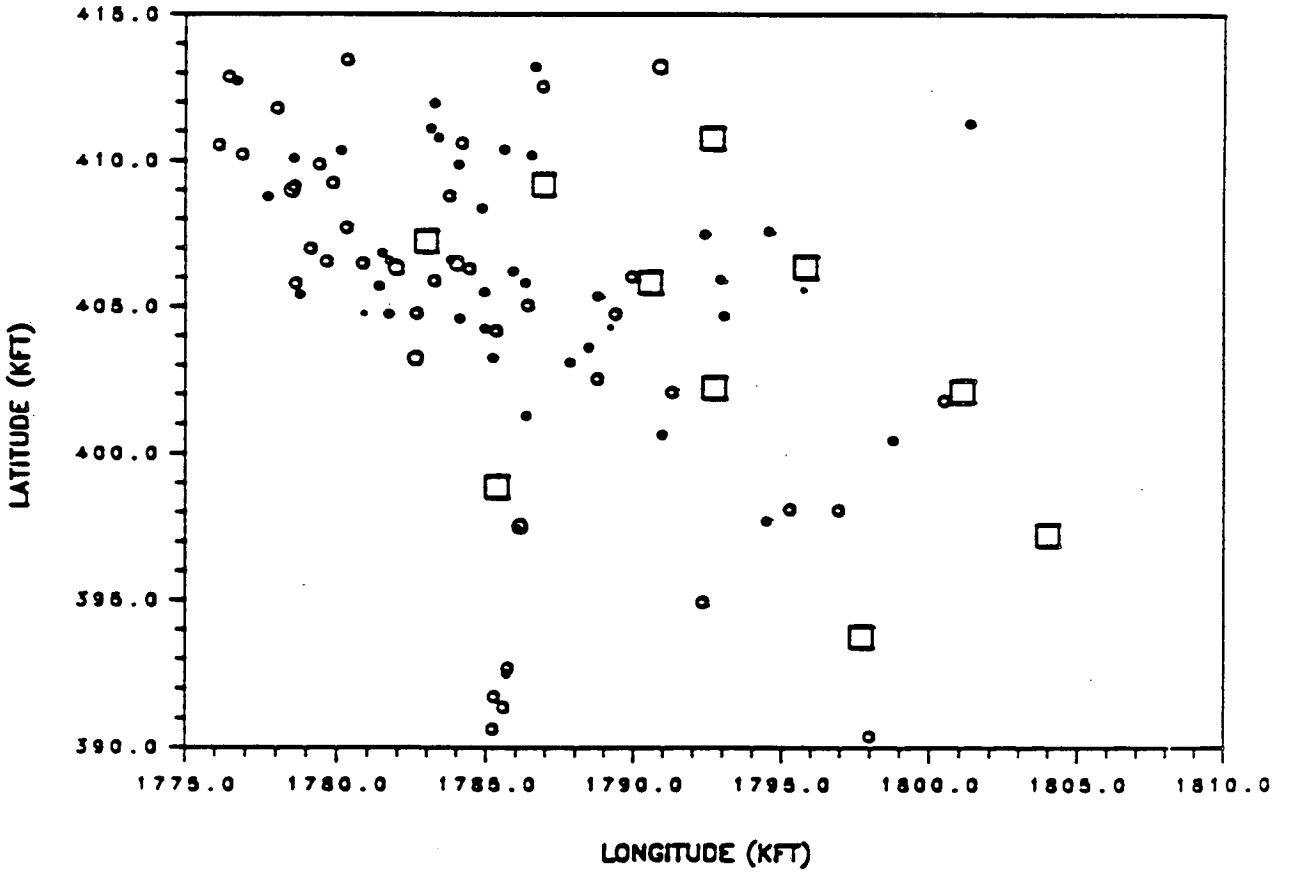

SOUTH GEYSERS EARTHQUAKES
QUALITY AB EVENTS DEEPER THAN -15 KFT ELEVATION
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)
MAGNITUDES
M < 1.0
1.0 ≤ M < 1.5
1.5 ≤ M < 2.0
2.0 ≤ M < 2.5
2.5 ≤ M < 3.0
3.0 ≤ M
STATIONS

FIGURE 9d

TABLE 4

EARTHQUAKE COUNTS WITH DEPTH, AB QUALITY

Elev (kft)	Total	M<1.Ø	1.Ø<M<1.5	1.5<M<2.Ø	2.Ø<M
5 to Ø	12	12	Ø	Ø	Ø
Ø to -5	1Ø3	76	27	Ø	Ø
-5 to -1Ø	147	58	78	1Ø	1
-1Ø to -15	433	29	224	16Ø	2Ø
-15 to -2Ø	65	3	34	26	2
-2Ø+	17	Ø	3	1Ø	4

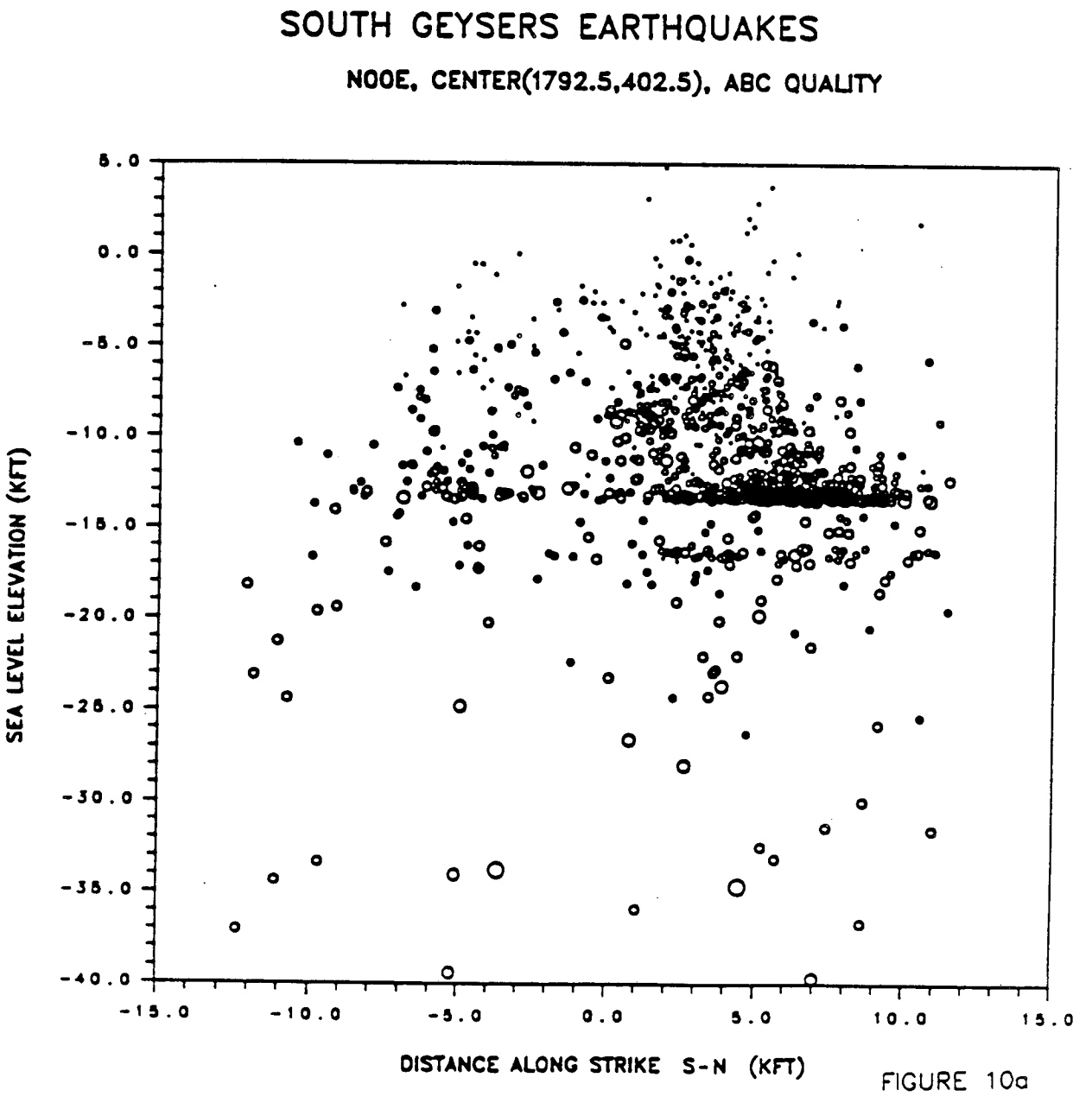

SOUTH GEYSERS EARTHQUAKES
NOOE, CENTER(1792.5,402.5), ABC QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE S-N (KFT)

FIGURE 10a

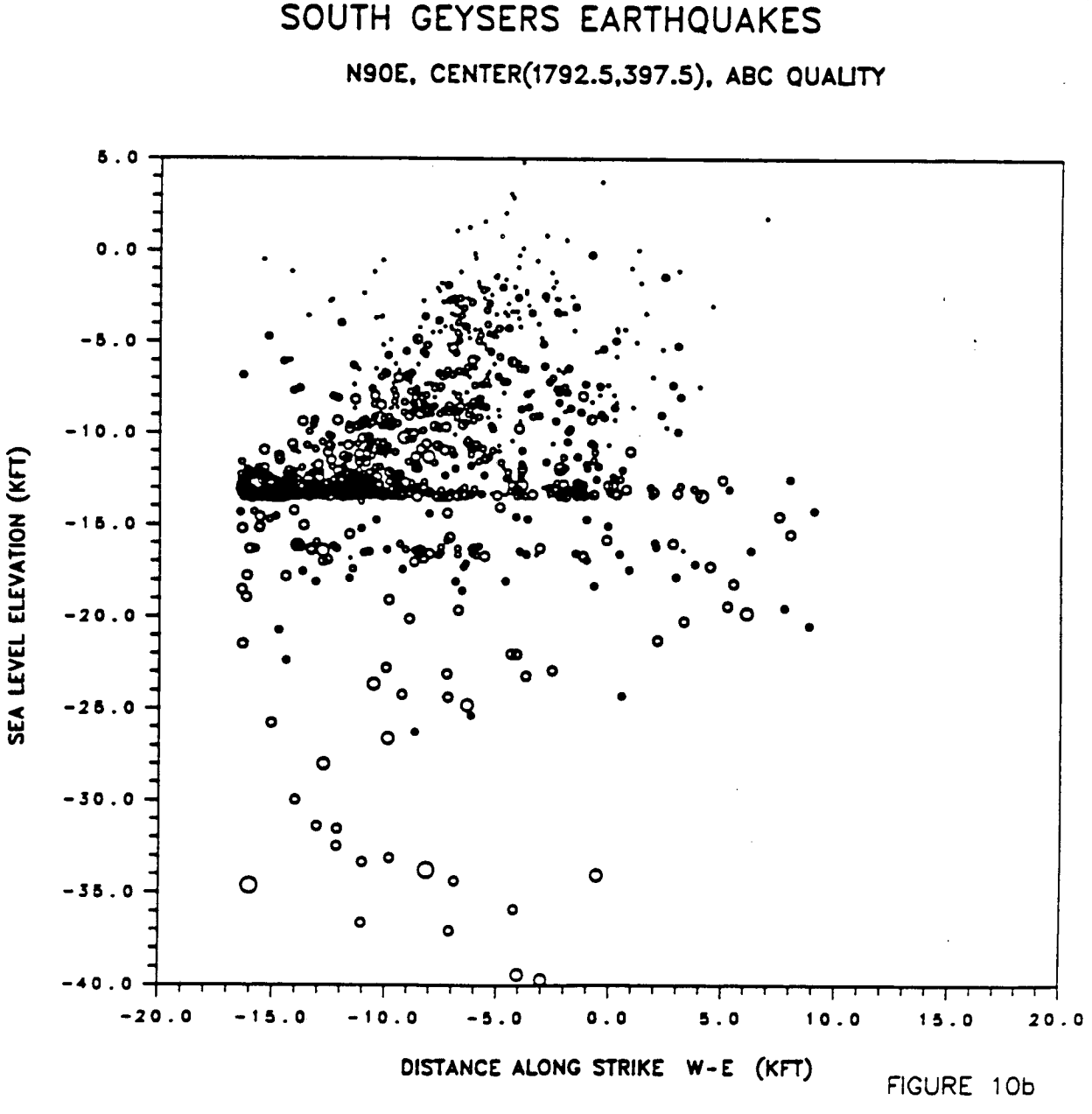

SOUTH GEYSERS EARTHQUAKES
N90E, CENTER(1792.5,397.5), ABC QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-20.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
20.0
DISTANCE ALONG STRIKE W-E (KFT)

FIGURE 10b

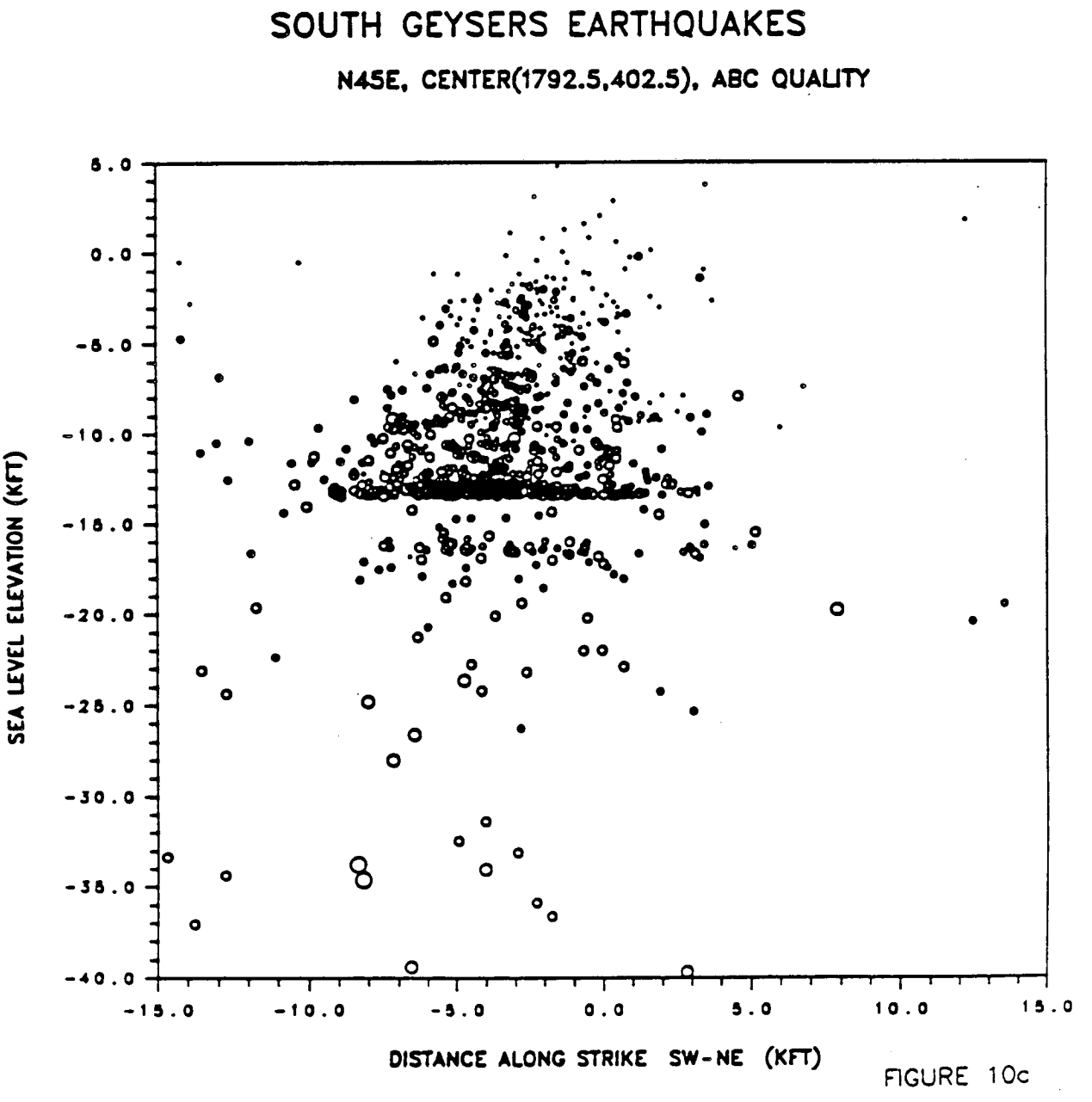

SOUTH GEYSERS EARTHQUAKES
N45E, CENTER(1792.5,402.5), ABC QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE SW-NE (KFT)

FIGURE 10c

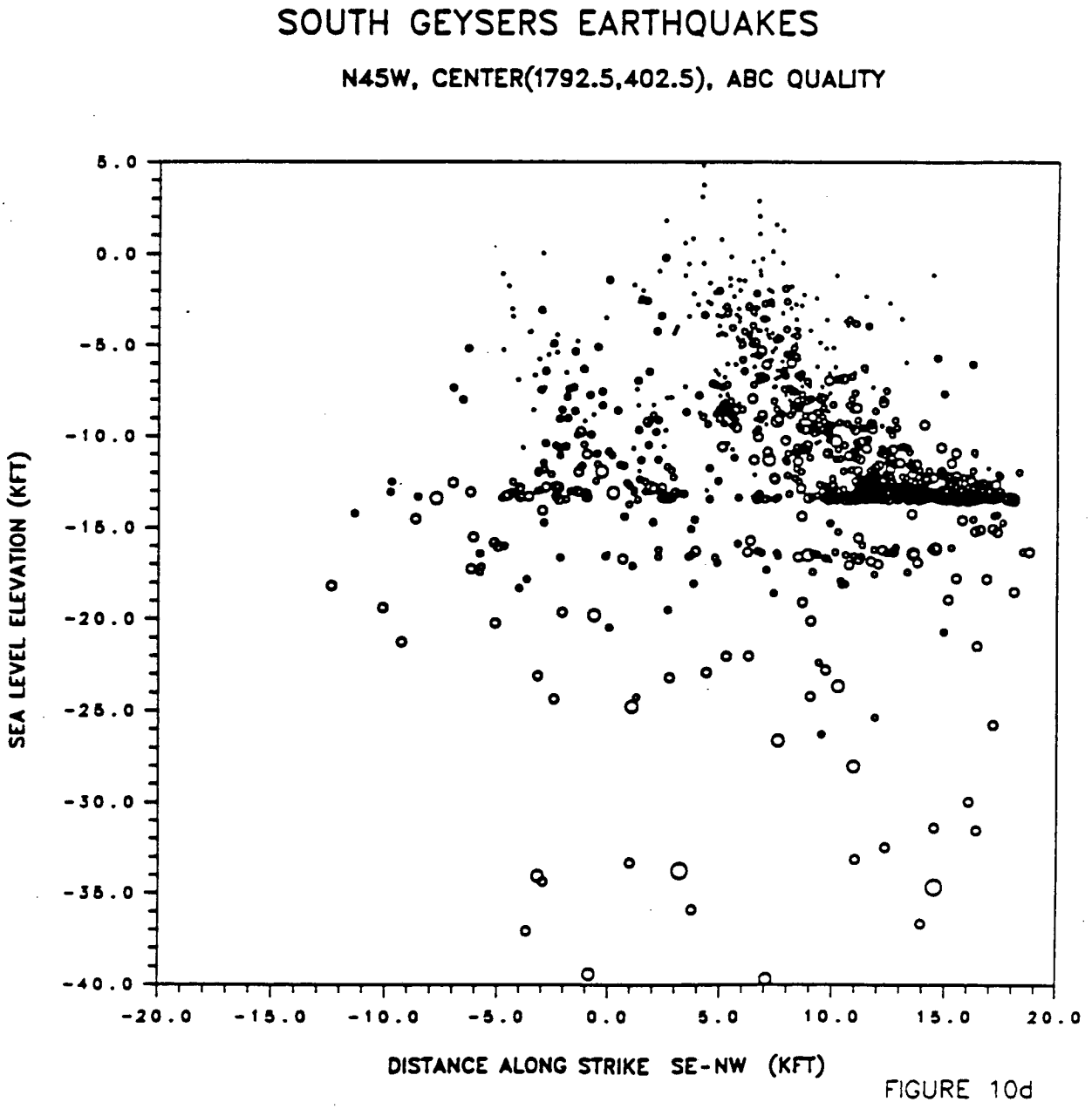

SOUTH GEYSERS EARTHQUAKES
N45W, CENTER(1792.5,402.5), ABC QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-20.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
20.0
DISTANCE ALONG STRIKE SE-NW (KFT)

FIGURE 10d

common problem in hypocentral locations, and only stands out well here because so many events happened to occur in that depth range. Some of the events that are grouped above the halfspace can be imagined to spread into the area just below it which has few earthquakes.

These plots reveal a strong outline to the seismicity which seems to dome inside the array, the shallowest part near the array center. The dropoff in the north and west directions is very distinct, whereas the boundary to the south and east is less so, perhaps because there are fewer events, but the trend can still be seen. The northeast-southwest section in Figure 10c is almost perpendicular to the map trend of seismicity with a viewpoint along strike and reveals the narrowest dome of seismicity with a clear dropoff in both directions. Interestingly, in this direction the linear feature seen in Figure 7, and discussed in the section on epicenter distributions, would extend through the peak of this dome and along its long axis in the north-west direction. A rough contour sketch from these plots showing the upper bound of seismicity can be seen in Figure 11.

A correspondence of this domal shape and the geological structure or reservoir conditions in the region would seem likely. The depth to the felsite body underlying the array, as determined by well logs (Beall, 1988), has been contoured and found to have a moderately-elongate dome-like shape with a peak very close to that of the seismicity. The felsite unit has a steeper side on the east than the west, also similar in shape to the pattern of seismicity, but tends to drop off less steeply overall. The distribution of shallowest steam also corresponds with the shallowest felsite and seismicity (Beall, 1988). The possibility also exists that the strong lateral velocity inhomogeneity of this region, perhaps again due to the intrusive body, affected the locations enough to produce this dome-like feature.

In the section which is nearly along the strike of map trends (Fig. 10d), a lack of earthquakes forms a band across the plot at an angle similar to the outer boundary on the northwest, forming the two groups of seismicity. This is seen in map view as a band trending east-northeast across the center of the array. Many events appear in

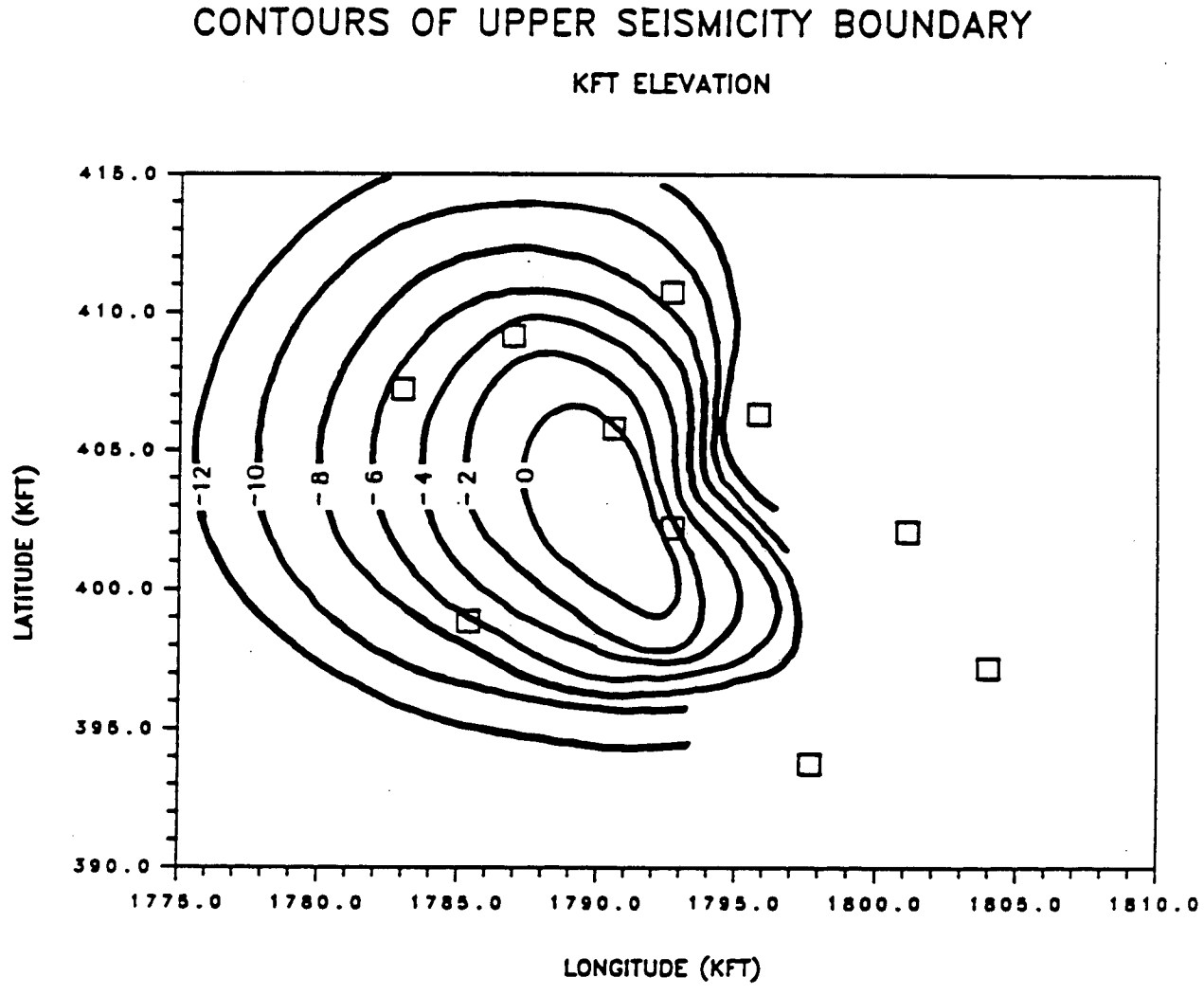

CONTOURS OF UPPER SEISMICITY BOUNDARY
KFT ELEVATION
415.0
410.0
405.0
400.0
395.0
390.0
LATITUDE (KFT)
-12
-10
-8
-6
-4
-2
0
1775.0
1780.0
1785.0
1790.0
1795.0
1800.0
1805.0
1810.0
LONGITUDE (KFT)

FIGURE 11

short, linear groups of 3-10 events, which may reflect the fracture system. There are a number of small clusters, the most outstanding one situated at 1786.5 kft E and 404 kft N inside the array. It can also be seen in cross-section on Fig. 10d at 5 kft northwest and -9 kft elevation.

Plots in Figures 12a-e and 13a-e are 5kft thick sections in east-west and north-south directions respectively, using only A and B quality events. More interesting features emerge. In Figure 13b, there is an isolated group of 7 events just outside the array in the southwest which are the same size and close to the same distance apart from each other. They are separated from the northern group, which has a sharp boundary to its southern end that dips steeply to the north. Figure 13c also shows north-dipping trends, and it can be seen that the close cluster at about 403 kft N, mentioned in the epicenter section, is tight in depth as well. A line of 5 larger, deeper events extend straight down on the east-west section near the southern end of the study area (Fig. 12a). They can also be seen in the north- south section (Fig. 13c), where they appear almost linear as well, as if they fractured a long, thin planar area with dimensions of about 20 by 3 kft.

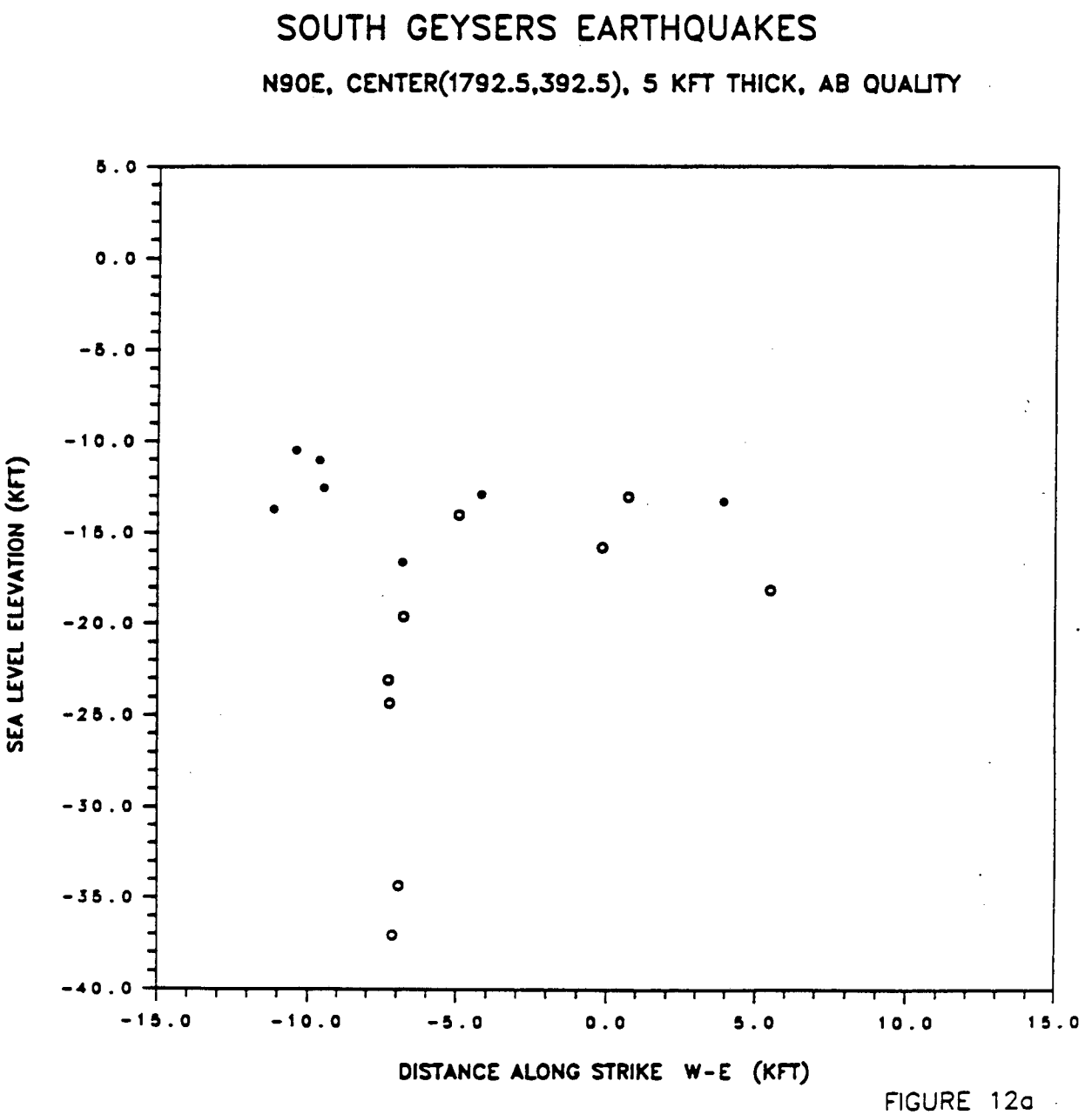

SOUTH GEYSERS EARTHQUAKES
N90E, CENTER(1792.5,392.5), 5 KFT THICK, AB QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE W-E (KFT)

FIGURE 12a

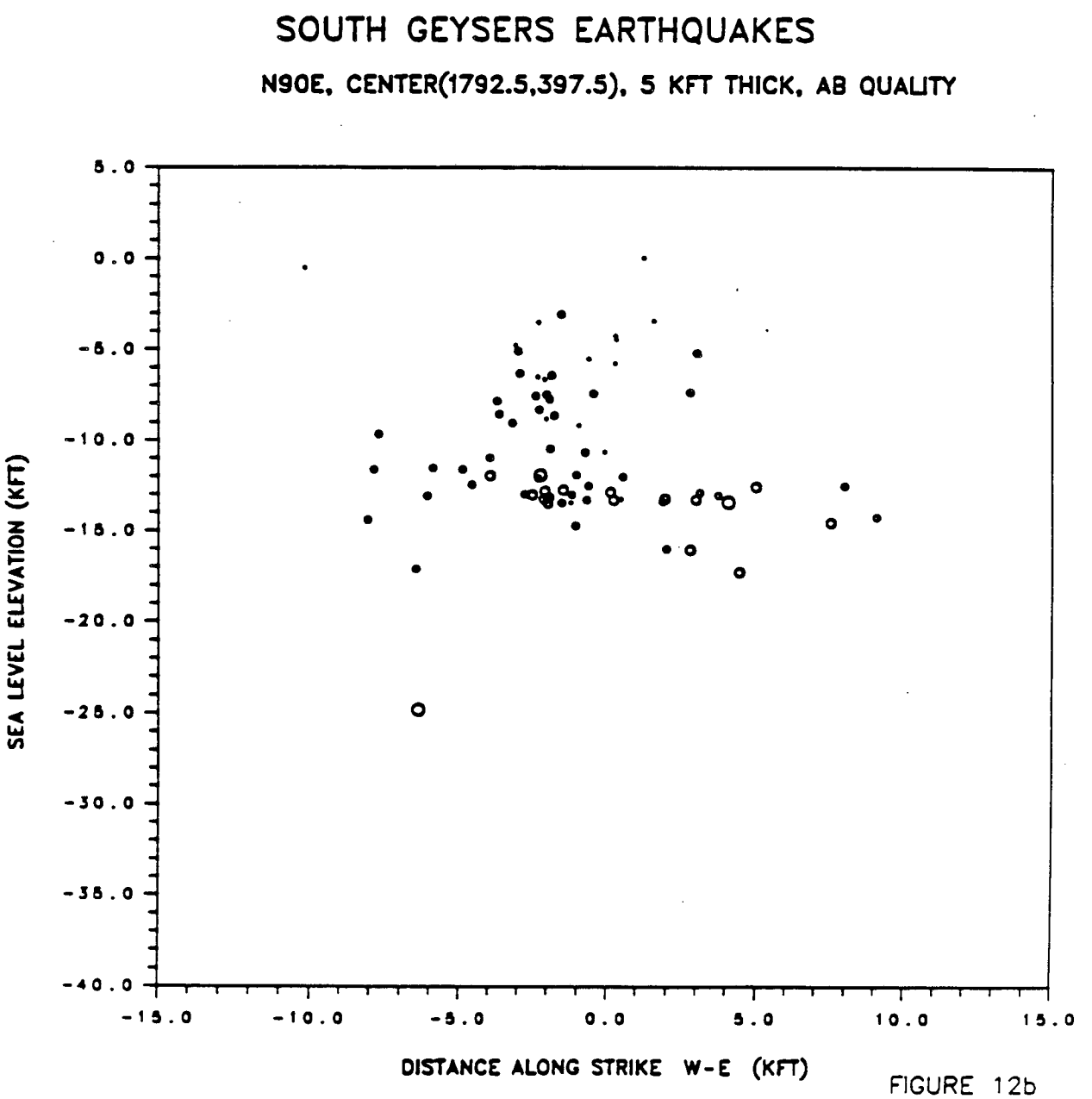

SOUTH GEYSERS EARTHQUAKES
N90E, CENTER(1792.5,397.5), 5 KFT THICK, AB QUALITY
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
SEA LEVEL ELEVATION (KFT)
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE W-E (KFT)

FIGURE 12b

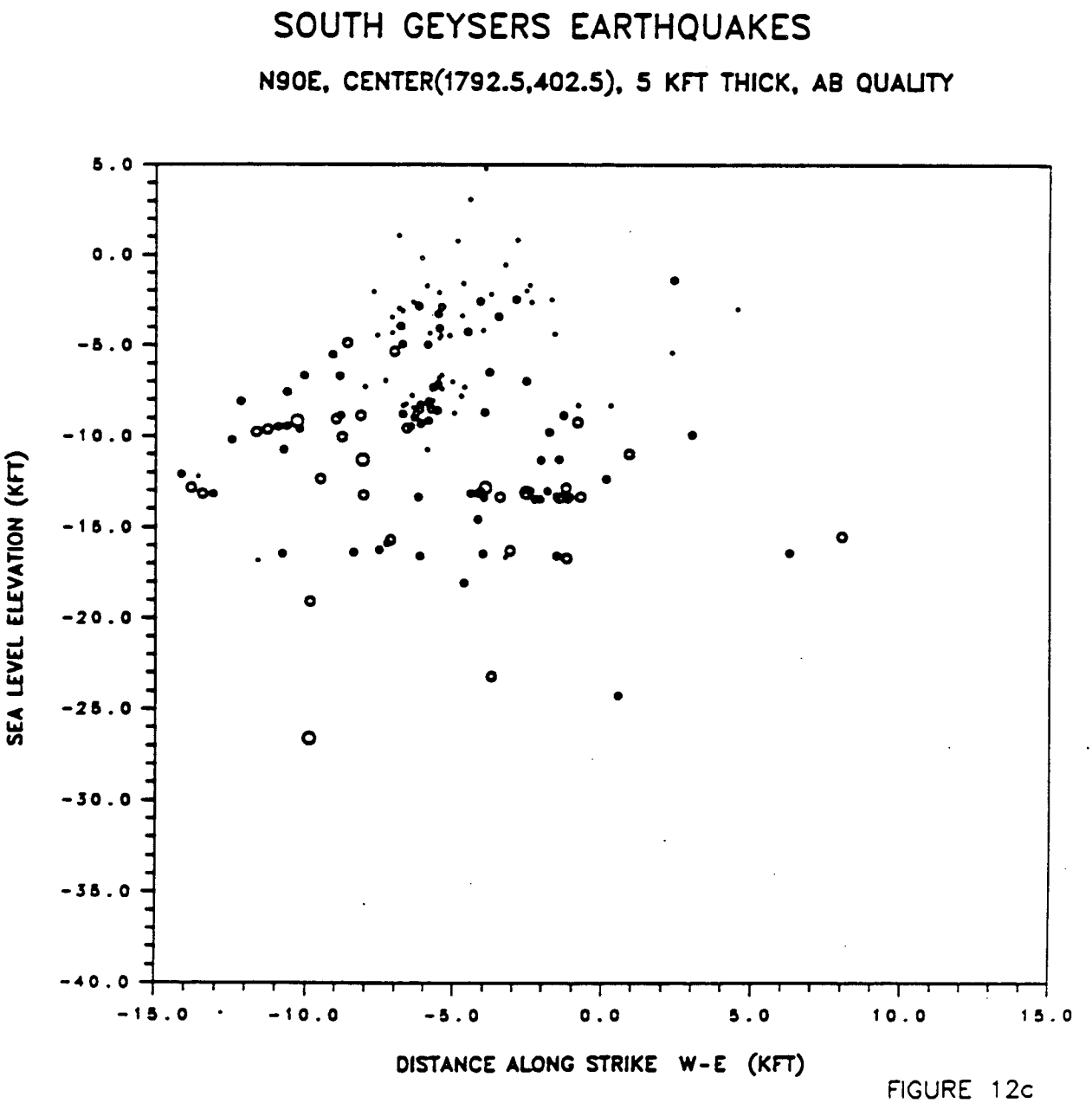

SOUTH GEYSERS EARTHQUAKES
N90E, CENTER(1792.5,402.5), 5 KFT THICK, AB QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE W-E (KFT)

FIGURE 12c

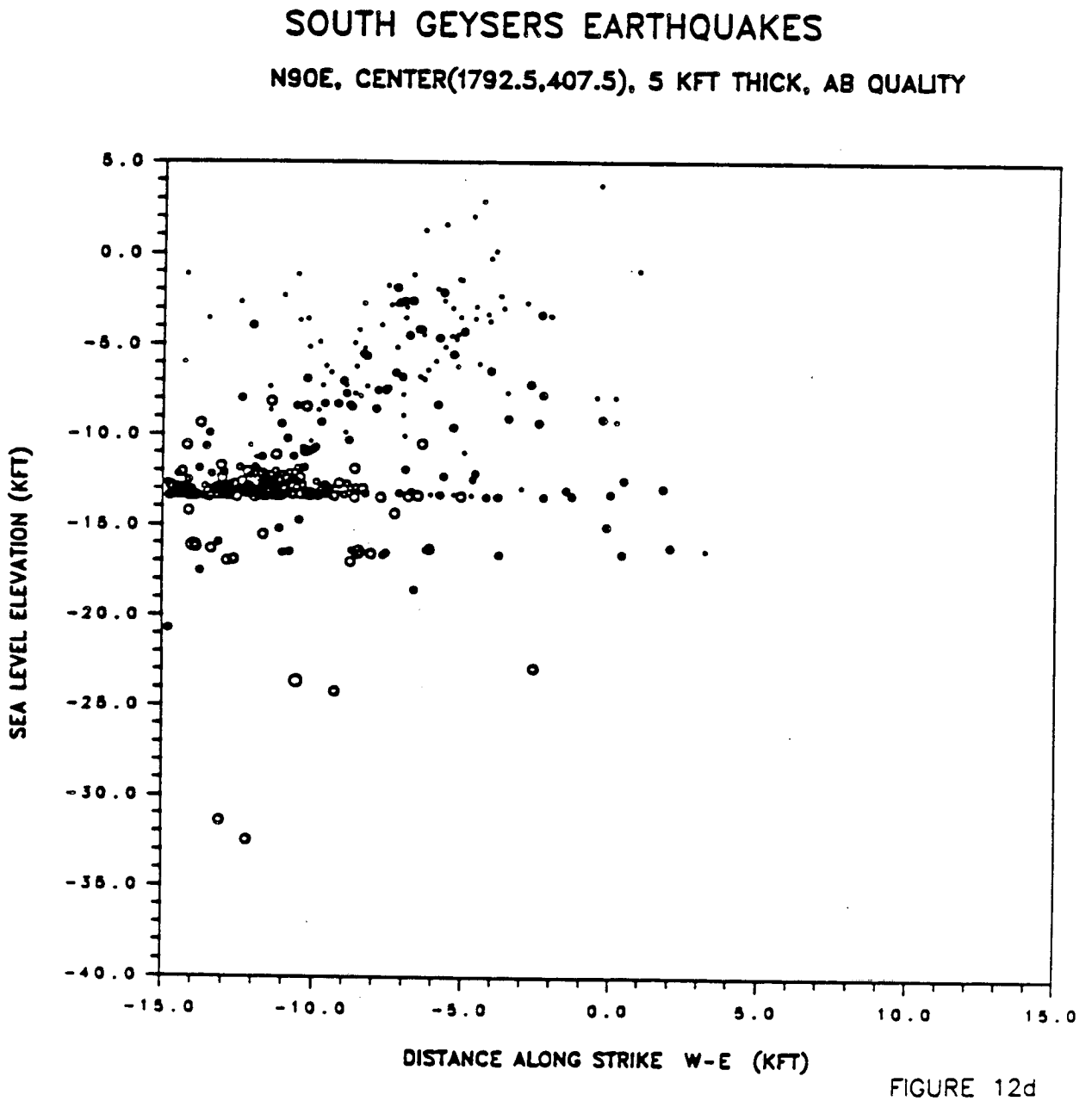

SOUTH GEYSERS EARTHQUAKES
N90E, CENTER(1792.5,407.5), 5 KFT THICK, AB QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE W-E (KFT)

FIGURE 12d

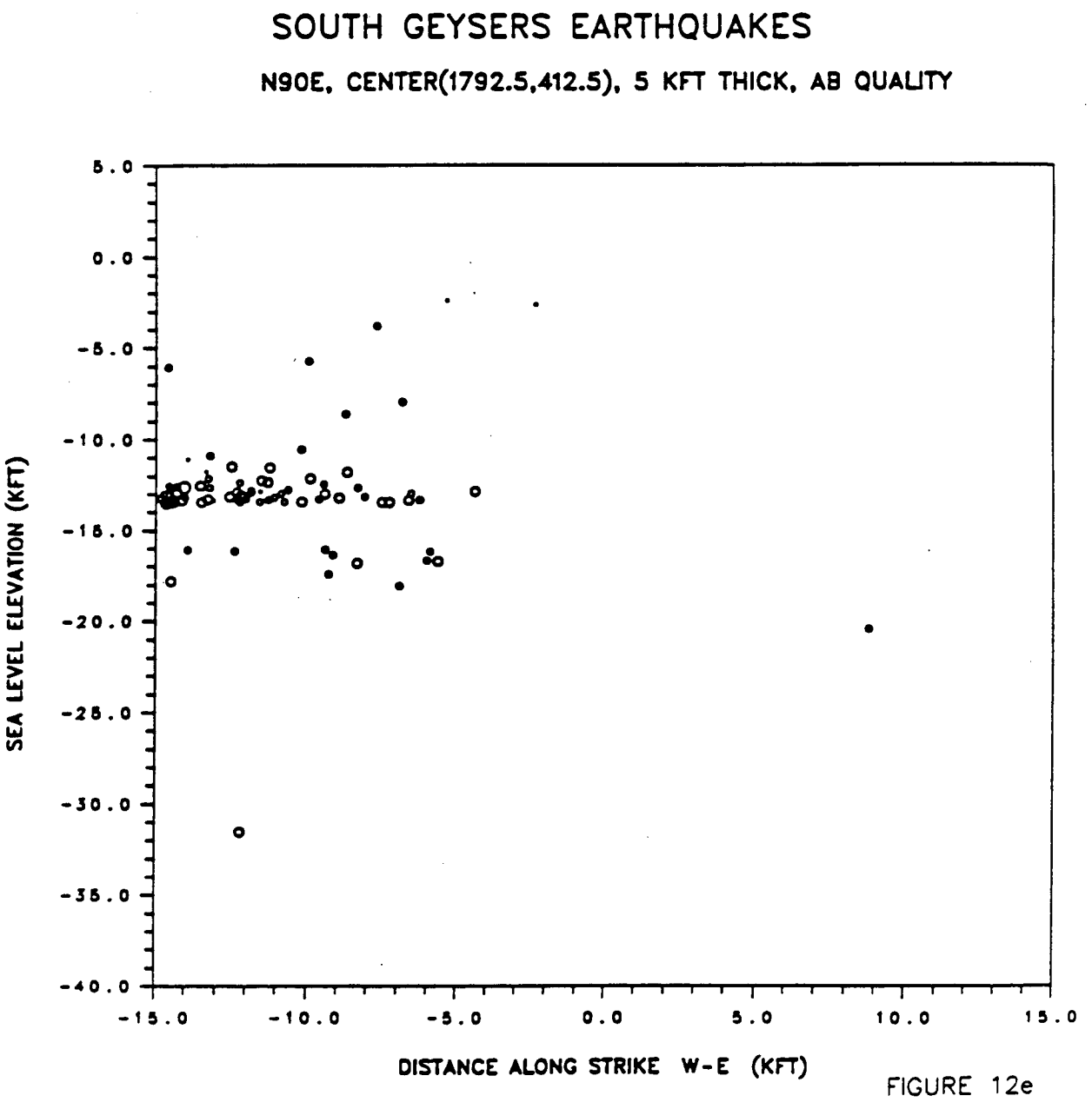

SOUTH GEYSERS EARTHQUAKES
N90E, CENTER(1792.5,412.5), 5 KFT THICK, AB QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE W-E (KFT)

FIGURE 12e

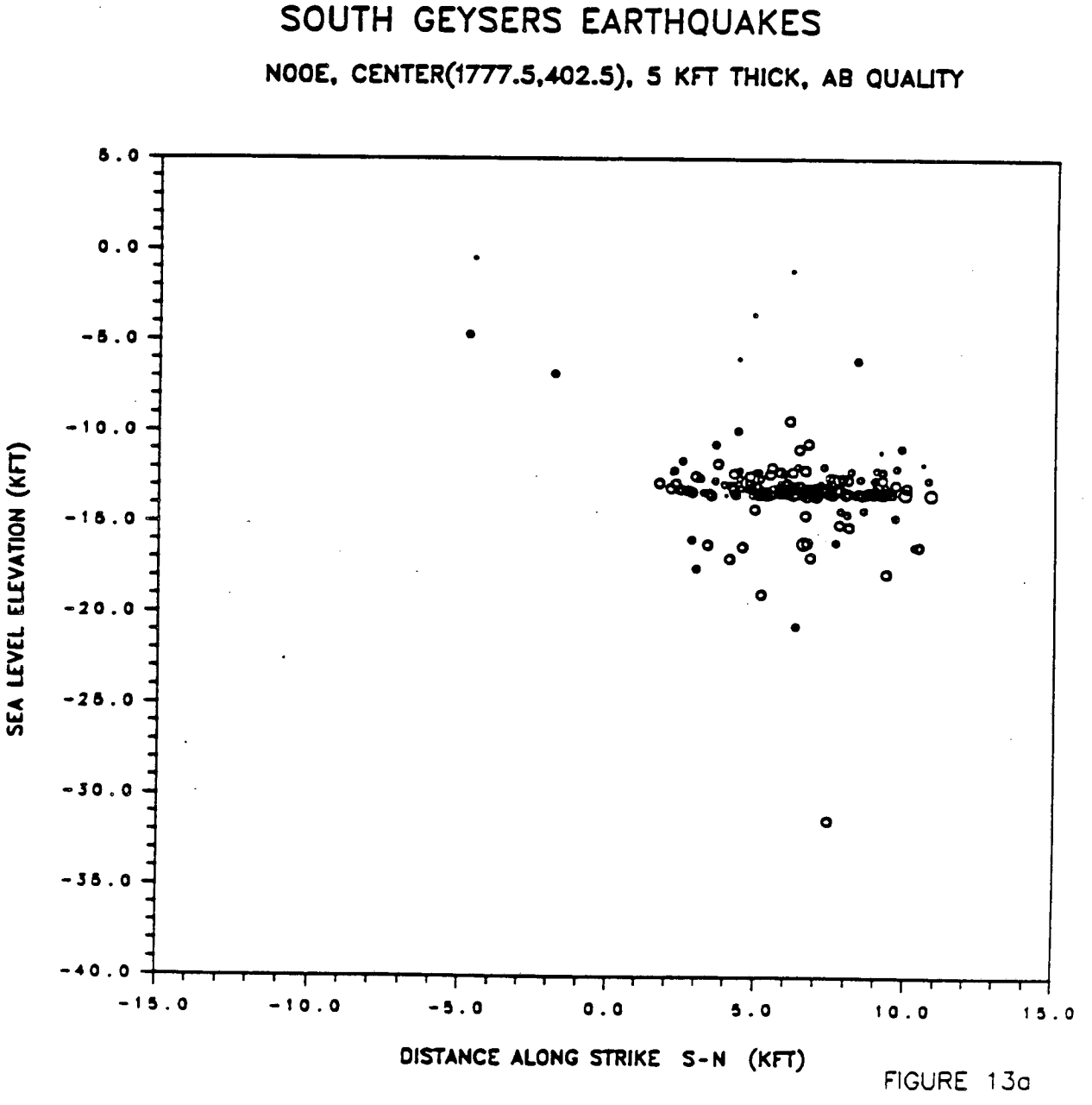

SOUTH GEYSERS EARTHQUAKES
NOOE, CENTER(1777.5,402.5), 5 KFT THICK, AB QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE S-N (KFT)

FIGURE 13a

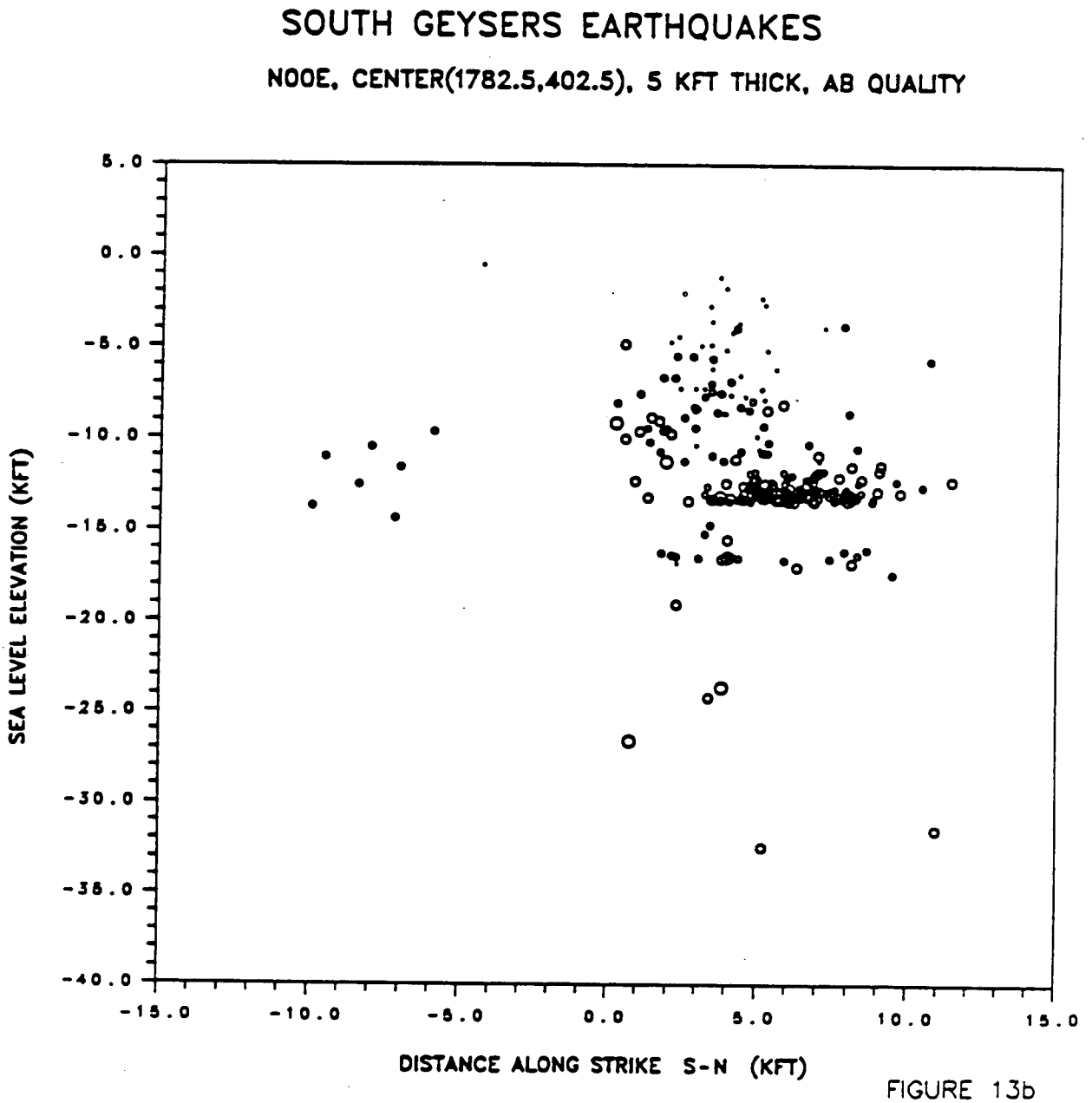

SOUTH GEYSERS EARTHQUAKES
NOOE, CENTER(1782.5,402.5), 5 KFT THICK, AB QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE S-N (KFT)

FIGURE 13b

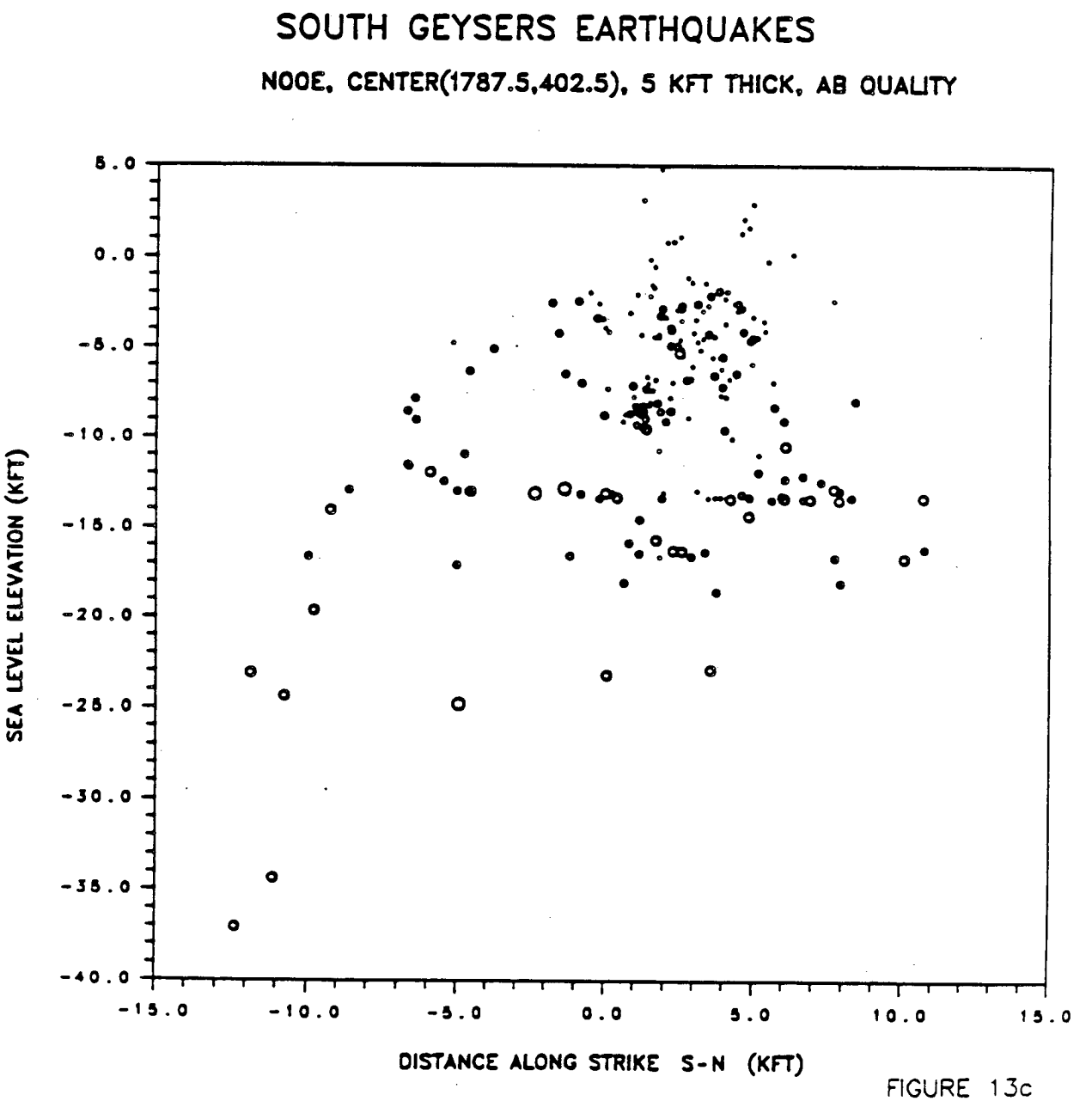

SOUTH GEYSERS EARTHQUAKES
NOOE, CENTER(1787.5,402.5), 5 KFT THICK, AB QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE S-N (KFT)

FIGURE 13c

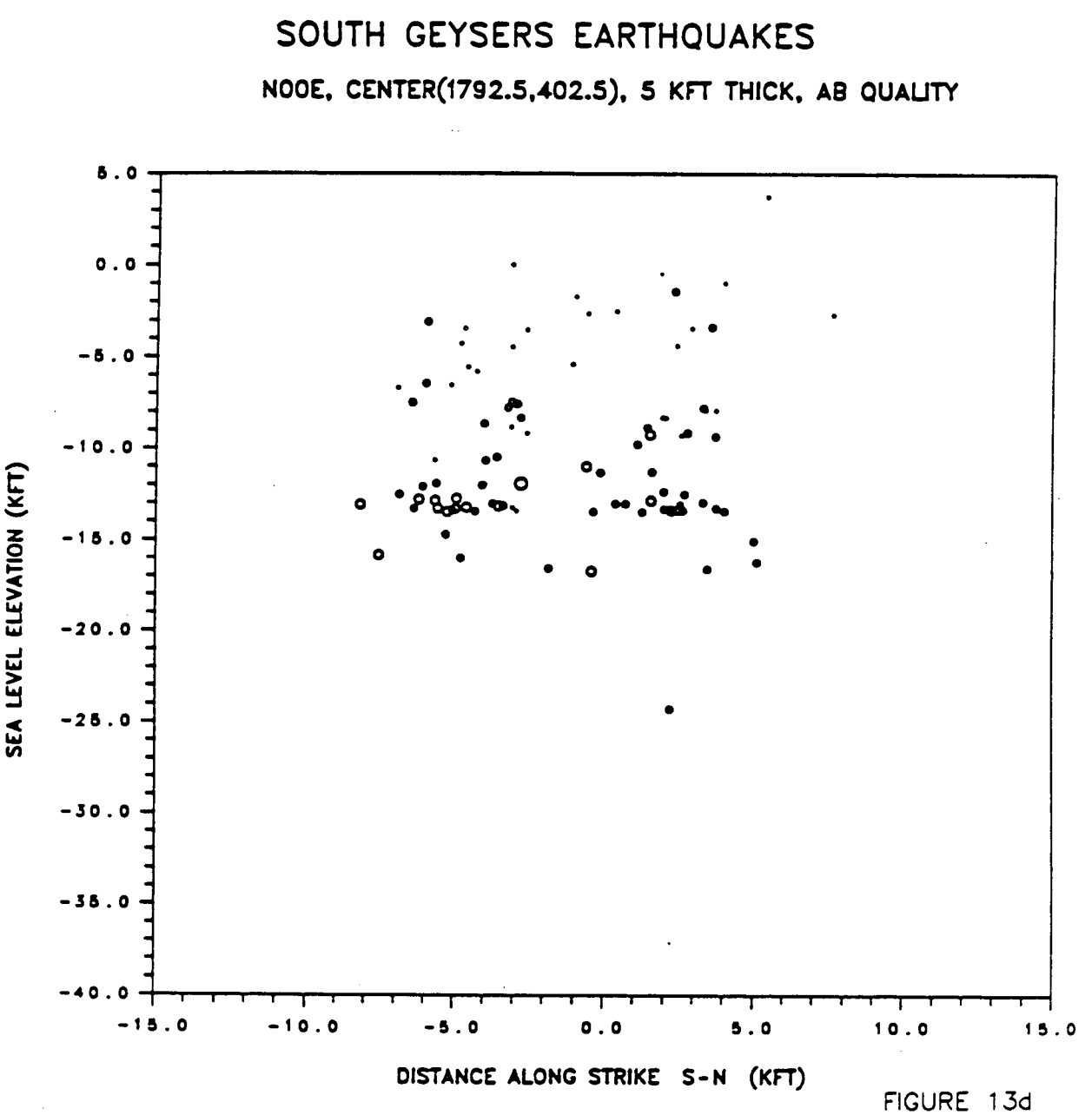

SOUTH GEYSERS EARTHQUAKES
N00E, CENTER(1792.5,402.5), 5 KFT THICK, AB QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE S-N (KFT)

FIGURE 13d

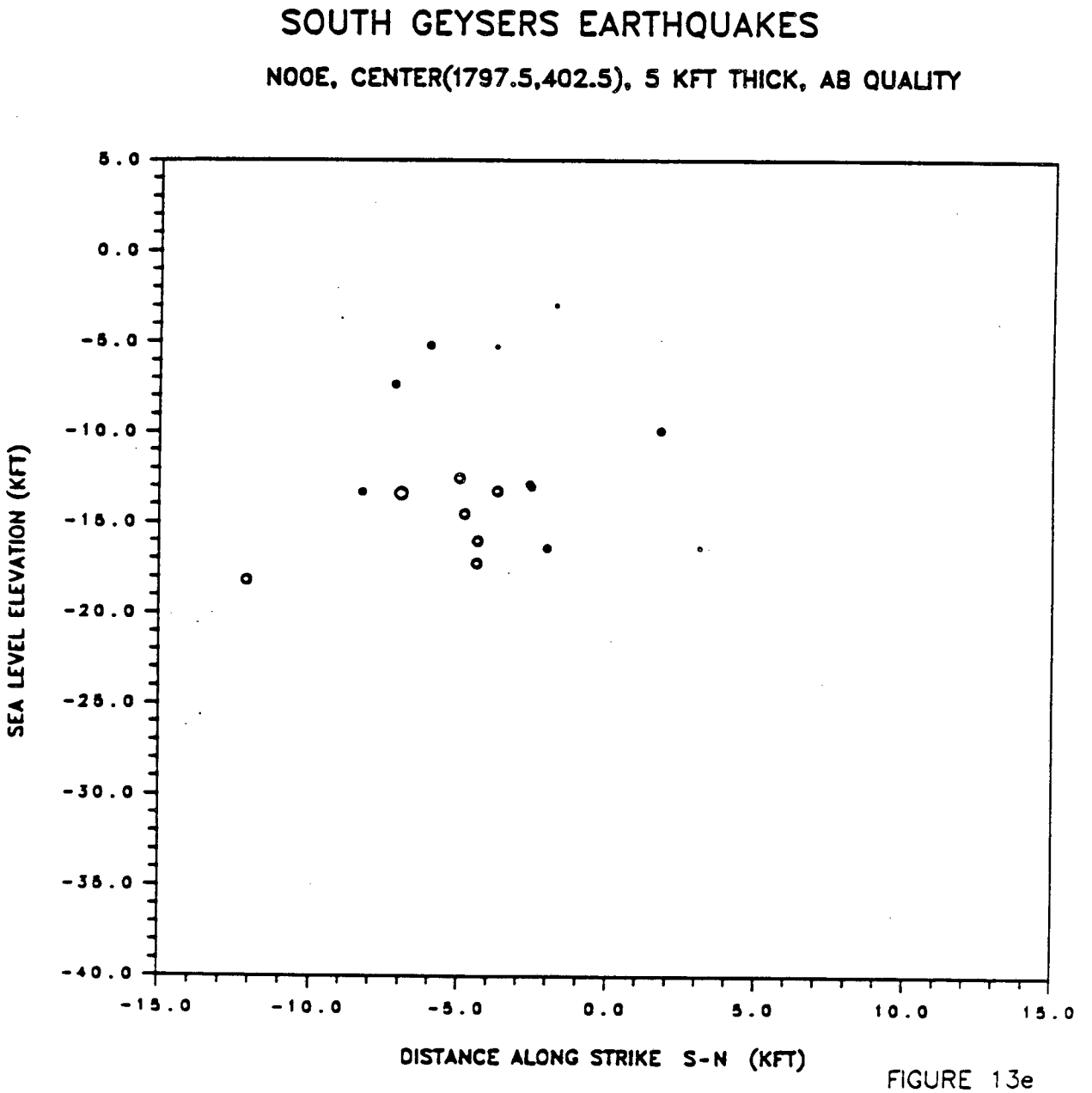

SOUTH GEYSERS EARTHQUAKES
N00E, CENTER(1797.5,402.5), 5 KFT THICK, AB QUALITY
SEA LEVEL ELEVATION (KFT)
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-15.0
-10.0
-5.0
0.0
5.0
10.0
15.0
DISTANCE ALONG STRIKE S-N (KFT)

FIGURE 13e

TEMPORAL OCCURRENCE

Daily Sums.

There are two major methods used when studying the temporal occurrence of earthquakes. One is simply a count of the number of events in given time periods; the other is a sum of the energy or moment associated with the events in those time periods. Each reveal characteristics which may be missed when using one or the other. Plots of earthquake counts assume that each earthquake has the same weight, whereas we know that larger earthquakes usually rupture a larger area and release more energy, and so are more important. (An increase in one magnitude level corresponds to an increase in energy release of about 30.) The moment sum accounts for this, but may also be so dominated by large events that the smaller ones, which could be occurring in critical places, are lost. It is, therefore, most informative to look at a combination of the two.

The daily earthquake counts were summed from only the events which were successfully located within the study area, and are plotted in Figure 14. The moments of all of these earthquakes in each day were summed and plotted in Figure 15. Both are listed in Table 5. The most active time during the recording period was 7/9 to 8/2 (200-214 JD), with peaks on 7/23 of 21 events and 7/31 of 25 events. A few days had only one event, which were the smallest counts, and the average rate was 7.85 per day with a population standard deviation of 4.48.

The moment rate was 7.9×10^{18} dyne-cm per day, and a comparison between these two plots reveals that the log of moment release was more constant than the number of daily earthquakes. Except for a few solitary peaks due to the largest events, the log moment sum appears fairly flat. A low level of activity corresponds well with low moment sums 10/2 to 10/15 (275-288 JD). The greatest activity from 7/19 to 8/2 doesn't show up on the moment plot, indicating that though there were more events than average then, they were small and did not release more energy than usual.

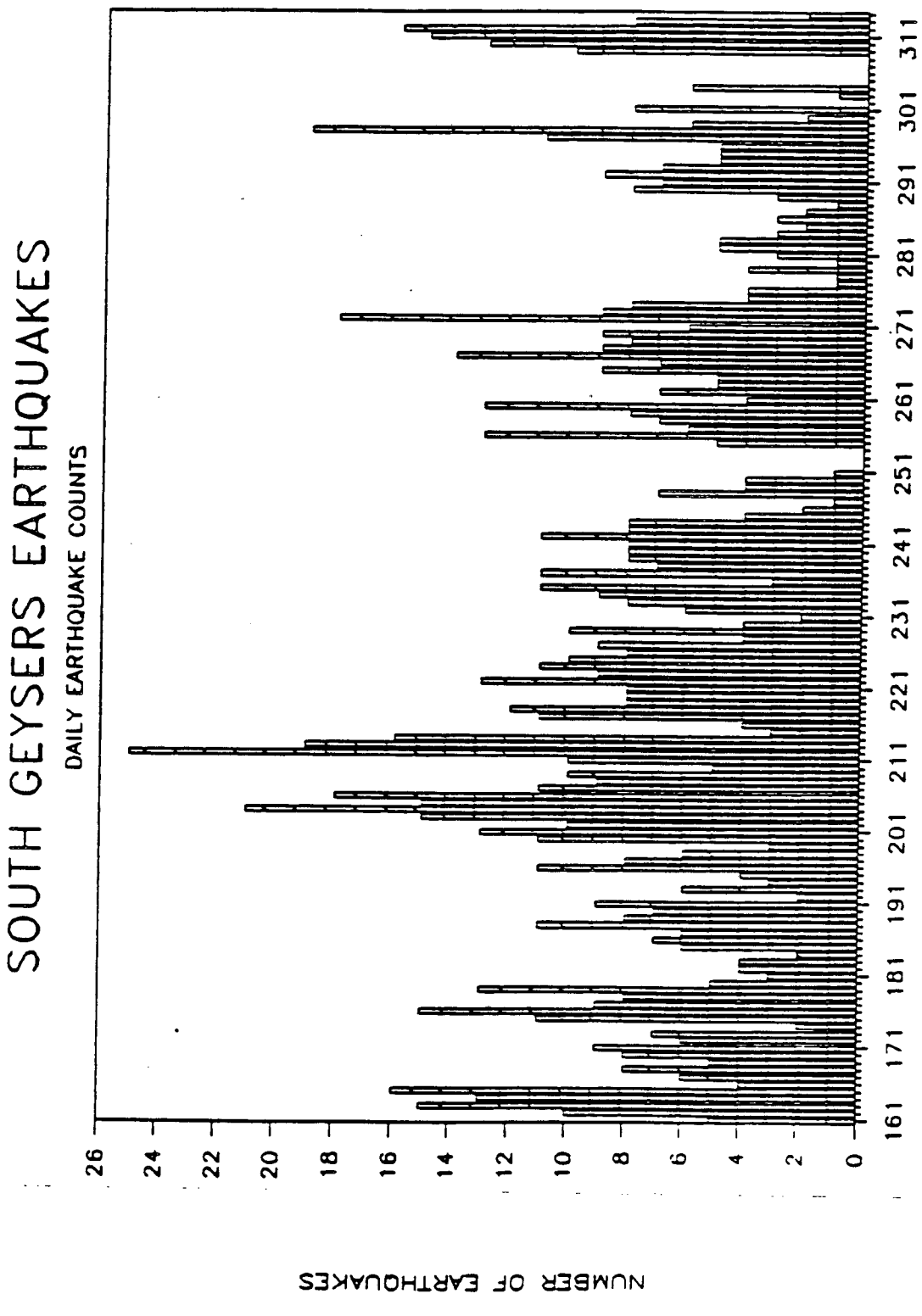

SOUTH GEYSERS EARTHQUAKES
DAILY EARTHQUAKE COUNTS
NUMBER OF EARTHQUAKES
0
2
4
6
8
10
12
14
16
18
20
22
24
26
161
171
181
191
201
211
221
231
241
251
261
271
281
291
301
311
JULIAN DAY

FIGURE 14

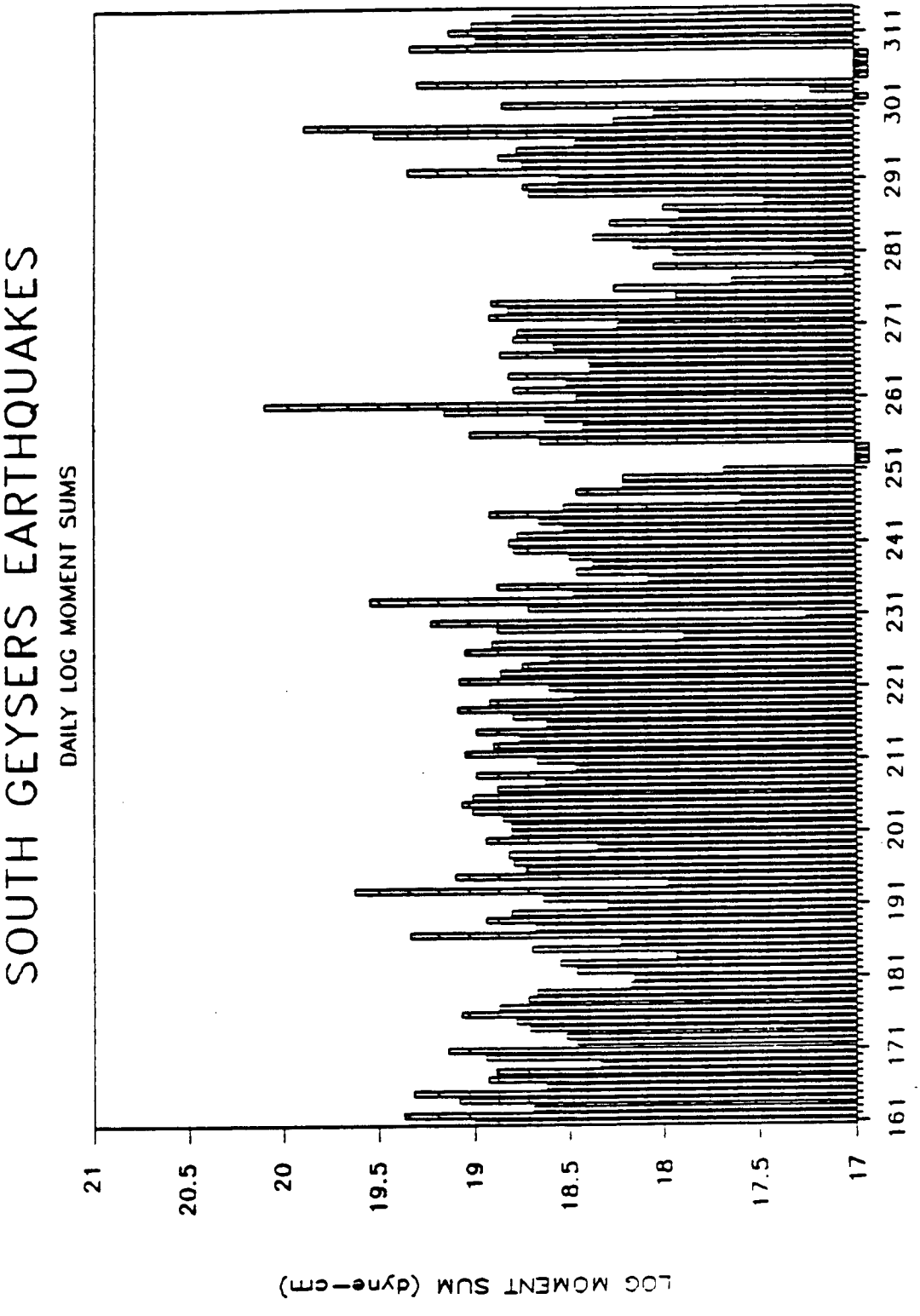

SOUTH GEYSERS EARTHQUAKES
DAILY LOG MOMENT SUMS
LOG MOMENT SUM (dyne-cm)
21
20.5
20
19.5
19
18.5
18
17.5
17
161
171
181
191
201
211
221
231
241
251
261
271
281
291
301
311
JULIAN DAY

FIGURE 15

TABLE 5

DAILY EARTHQUAKE COUNT & MOMENT SUMS

Julian day	date	no. of events	moment sum	log mom sum
161	610	5	0.101E+20	19.00
162	611	10	0.237E+20	19.37
163	612	15	0.490E+19	18.69
164	613	13	0.120E+20	19.08
165	614	16	0.207E+20	19.32
166	615	4	0.418E+19	18.62
167	616	6	0.847E+19	18.93
168	617	8	0.770E+19	18.89
169	618	5	0.219E+19	18.34
170	619	8	0.861E+19	18.94
171	620	9	0.139E+20	19.14
172	621	6	0.291E+19	18.46
173	622	7	0.330E+19	18.52
174	623	2	0.515E+19	18.71
175	624	11	0.601E+19	18.78
176	625	15	0.118E+20	19.07
177	626	9	0.734E+19	18.87
178	627	8	0.520E+19	18.72
179	628	13	0.467E+19	18.67
180	629	5	0.150E+19	18.18
181	630	3	0.145E+19	18.16
182	7 1	4	0.287E+19	18.46
183	7 2	4	0.356E+19	18.55
184	7 3	2	0.864E+18	17.94
185	7 4	6	0.503E+19	18.70
186	7 5	7	0.170E+19	18.23
187	7 6	6	0.217E+20	19.34
188	7 7	11	0.480E+19	18.68
189	7 8	8	0.871E+19	18.94
190	7 9	7	0.644E+19	18.81
191	710	9	0.199E+19	18.30
192	711	2	0.434E+19	18.64
193	712	6	0.426E+20	19.63
194	713	3	0.959E+18	17.98
195	714	4	0.125E+20	19.10
196	715	11	0.537E+19	18.73
197	716	8	0.619E+19	18.79
198	717	6	0.654E+19	18.82
199	718	3	0.224E+19	18.35
200	719	11	0.867E+19	18.94
201	720	13	0.651E+19	18.81
202	721	10	0.639E+19	18.81
203	722	15	0.715E+19	18.85
204	723	21	0.102E+20	19.01
205	724	15	0.118E+20	19.07
206	725	18	0.102E+20	19.01
207	726	11	0.755E+19	18.88
208	727	9	0.422E+19	18.63
209	728	10	0.985E+19	18.99
210	729	5	0.297E+19	18.47
211	730	10	0.471E+19	18.67
212	731	25	0.113E+20	19.05
213	8 1	19	0.801E+19	18.90
214	8 2	16	0.571E+19	18.76
215	8 3	3	0.970E+19	18.99
216	8 4	4	0.417E+19	18.62
217	8 5	11	0.628E+19	18.80
218	8 6	12	0.123E+20	19.09
219	8 7	8	0.829E+19	18.92

220	8 8	8	0.305E+19	18.48
221	8 9	8	0.404E+19	18.61
222	810	13	0.120E+20	19.08
223	811	9	0.717E+19	18.86
224	812	11	0.560E+19	18.75
225	813	10	0.403E+19	18.60
226	814	8	0.112E+20	19.05
227	815	9	0.809E+19	18.91
228	816	4	0.788E+18	17.90
229	817	10	0.752E+19	18.88
230	818	4	0.170E+20	19.23
231	819	2	0.183E+18	17.26
232	820	6	0.523E+19	18.72
233	821	8	0.353E+20	19.55
234	822	9	0.304E+19	18.48
235	823	11	0.754E+19	18.88
236	824	3	0.120E+19	18.08
237	825	11	0.287E+19	18.46
238	826	7	0.239E+19	18.38
239	827	8	0.316E+19	18.50
240	828	8	0.620E+19	18.79
241	829	8	0.654E+19	18.82
242	830	11	0.586E+19	18.77
243	831	8	0.337E+19	18.53
244	9 1	8	0.453E+19	18.66
245	9 2	4	0.828E+19	18.92
246	9 3	2	0.336E+19	18.53
247	9 4	1	0.398E+18	17.60
248	9 5	7	0.291E+19	18.46
249	9 6	4	0.167E+19	18.22
250	9 7	4	0.165E+19	18.22
251	9 8	1	0.490E+18	17.69
255	912	5	0.451E+19	18.65
256	913	13	0.105E+20	19.02
257	914	6	0.270E+19	18.43
258	915	7	0.425E+19	18.63
259	916	8	0.146E+20	19.16
260	917	13	0.125E+21	20.10
261	918	4	0.292E+19	18.46
262	919	7	0.611E+19	18.79
263	920	5	0.326E+19	18.51
264	921	5	0.660E+19	18.82
265	922	9	0.243E+19	18.39
266	923	7	0.252E+19	18.40
267	924	14	0.721E+19	18.86
268	925	9	0.380E+19	18.58
269	926	8	0.615E+19	18.79
270	927	9	0.590E+19	18.77
271	928	6	0.176E+19	18.24
272	929	18	0.829E+19	18.92
273	930	9	0.654E+19	18.82
274	10 1	8	0.813E+19	18.91
275	10 2	4	0.870E+18	17.94
276	10 3	4	0.181E+19	18.26
277	10 4	1	0.437E+18	17.64
278	10 5	1	0.112E+18	17.05
279	10 6	4	0.112E+19	18.05
280	10 7	1	0.162E+18	17.21
281	10 8	3	0.892E+18	17.95
282	10 9	5	0.144E+19	18.16
283	1010	5	0.234E+19	18.37
284	1011	3	0.904E+18	17.96
285	1012	2	0.190E+19	18.28
286	1013	3	0.835E+18	17.92
287	1014	2	0.999E+18	18.00
288	1015	1	0.295E+18	17.47

289	1016	3	0.510E+19	18.71
290	1017	8	0.554E+19	18.74
291	1018	7	0.356E+19	18.55
292	1019	9	0.226E+20	19.35
293	1020	7	0.548E+19	18.74
294	1021	5	0.746E+19	18.87
295	1022	5	0.583E+19	18.77
296	1023	5	0.294E+19	18.47
297	1024	11	0.336E+20	19.53
298	1025	19	0.778E+20	19.89
299	1026	6	0.183E+19	18.26
300	1027	2	0.112E+19	18.05
301	1028	8	0.713E+19	18.85
303	1030	1	0.170E+18	17.23
304	1031	6	0.199E+20	19.30
309	11 5	10	0.217E+20	19.34
310	11 6	13	0.977E+19	18.99
311	11 7	15	0.133E+20	19.13
312	11 8	16	0.103E+20	19.01
313	11 9	8	0.615E+19	18.79
314	1110	2	0.641E+18	17.81

Periodicities.

A relatively simple method for searching a time series for possible periodicities is the calculation of its power density spectrum. This estimates the power at each frequency. In this study, the number of earthquakes which occurred per time interval were summed throughout the data. The resulting series was used in an analysis of periodic trends in the earthquake occurrence, with the idea that any cycles found may be related to natural or production-related activities which happen at regular intervals.

Continuous time series are required for the calculation of power spectra, so the data set had to be divided into two parts to accommodate missing data. Part one covers the time period from 6/11 to 9/7 and part two from 9/13 to 10/27. The spectra from these two time series were stacked to note the dominant periodicities which were constant throughout the study. The longest periods (lowest frequencies) which can be distinguished from the spectrum are limited by the length of the continuous data, because several periods must be sampled. The shortest periods (highest frequencies) are determined by the sampling interval, in this case the interval of time over which the earthquakes are summed.

Figure 16 is the power density spectrum for the two parts combined, using time intervals of 12 hours (0.5 days). Each peak which is seen to be above the noise is at a frequency which has more power than surrounding frequencies. A sine wave in the time series trans-forms to a spike in the frequency domain, so each peak can be interpreted as a possible cyclic variation in the seismicity. The peaks of interest are located at frequencies of 0.02, 0.075, 0.125, 0.16, 0.38, and 0.76 cycles per day, corresponding to periods of 50, 13.3, 8, 6.3, 2.6, and 1.3 days.

Further study of possible causes of these cycles, both natural and production-related, may be productive. Cross-correlations of this occurrence series with other non-periodic processes which may be triggering events may also reveal interesting connections which could lead to a better understanding of the earthquake-induction processes.

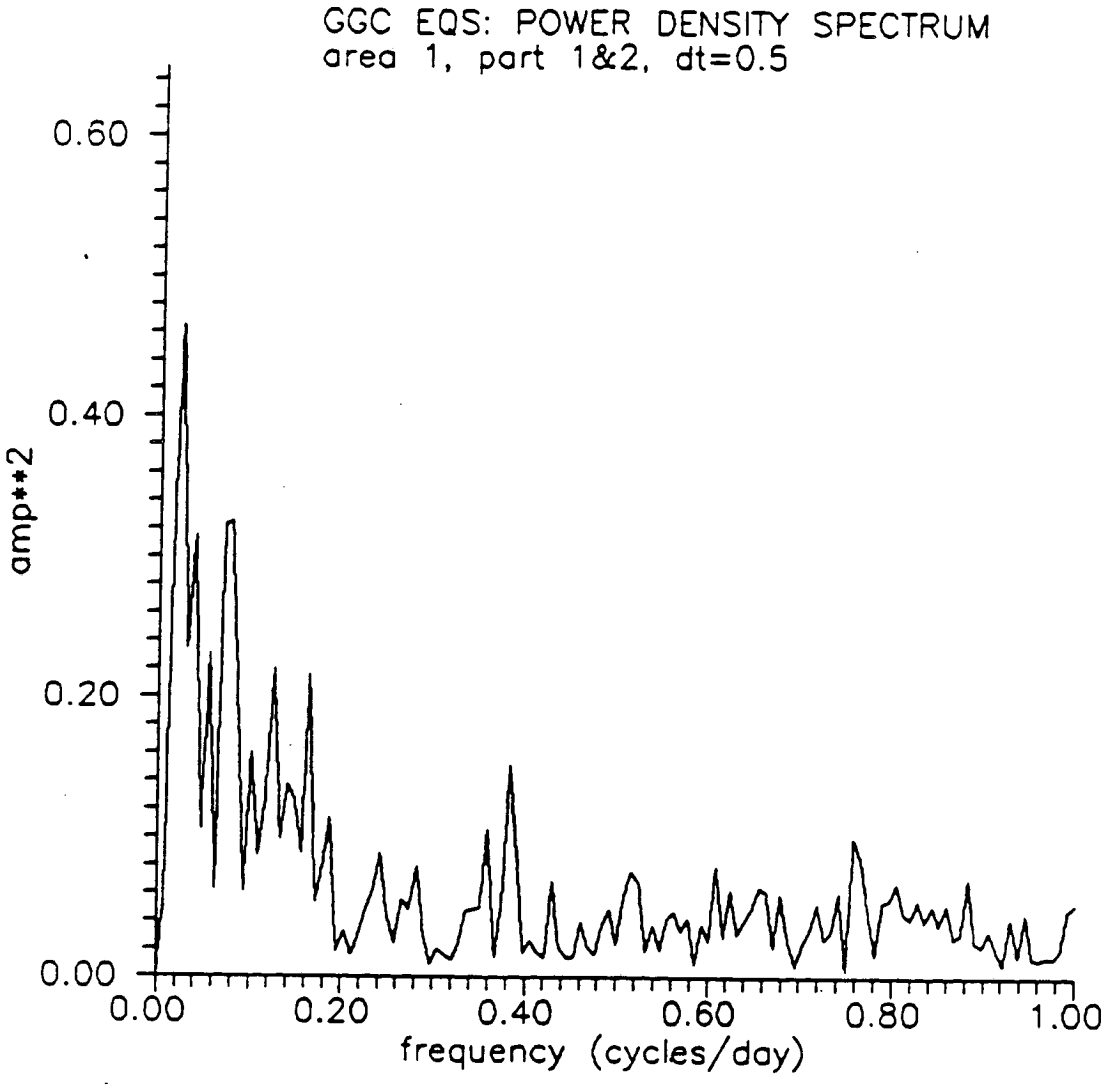

GGC EQS: POWER DENSITY SPECTRUM
area 1, part 1&2, dt=0.5
0.60
0.40
0.20
0.00
amp**2
0.00
0.20
0.40
0.60
0.80
1.00
frequency (cycles/day)

FIGURE 16

Migration.

Space-time plots were made by projecting all events of interest onto one vertical plane and plotting events along the linear map view of that plane as a function of time. These plots are useful for studying clusters of events in space and time, and also the migration of events from one place to another. Migration, especially of moderate to large events, is currently a topic of interest in earthquake seismology because of its implications in earthquake prediction and in the understanding of triggering mechanisms. One proposed mechanism for migration in California is stress waves, or creep waves, propagating northwestward from the spreading center in Baja California toward the subduction zones near Alaska (Savage, 1971). These spreading events could be triggering ruptures which are ripe to happen along their paths.

These microearthquakes, because of their size and relation to human activities, may exhibit not only migration patterns related to the regional California trends, but also local migration trends due to activities at the wells and the local fracture systems connected with them. Local pore pressure changes and stress changes propagating from/to wells or possibly from the local hydrothermal system may be important earthquake triggers in the geothermal environment.

To investigate possible trends on the local level, space-time plots were made in four directions, striking north-south, west-east, northeast-southwest, and northwest-southeast. All events greater than one were used in these plots, shown in Figures 17a-d. Local migration would look like linear trends which could be in any direction, rows of events occurring one after another in a line. The slope of the lines would give the rate of migration (i.e., strain pulse). There are many lineations in the data, but they are most numerous on the plot trending west-east (Fig. 17b), where the linear clusters seem to be the rule rather than the exception. This is especially true for the first three months of continuous data. Many of the clusters have events that are close to each other, having occurred a few hours apart; others are more spread out. The significance of this west to east and east to west migration is not immediately obvious, and could be investigated on smaller scales.

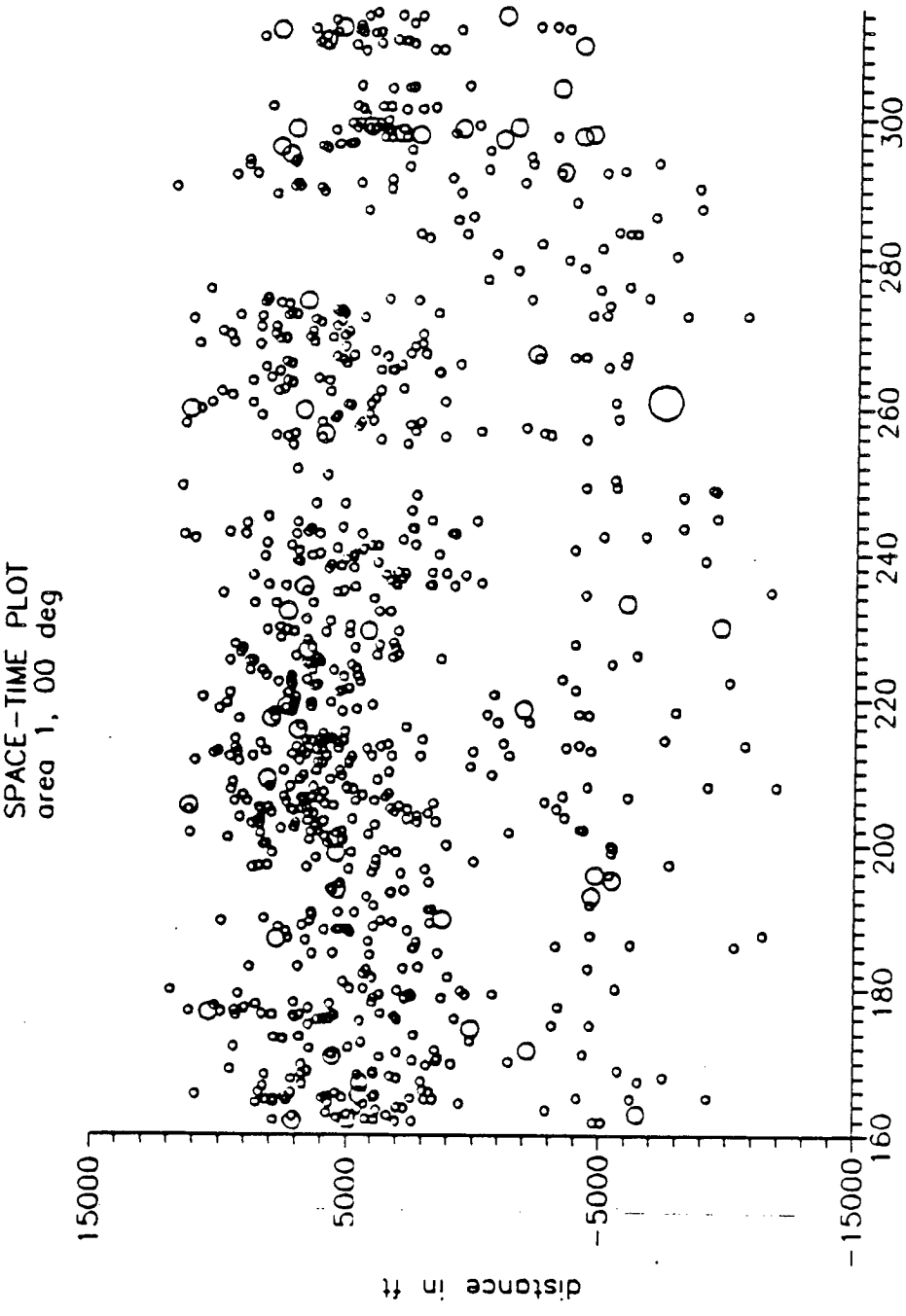

SPACE-TIME PLOT
area 1, 00 deg
15000
5000
-5000
-15000
distance in ft
160
180
200
220
240
260
280
300
Julian day

FIGURE 17a

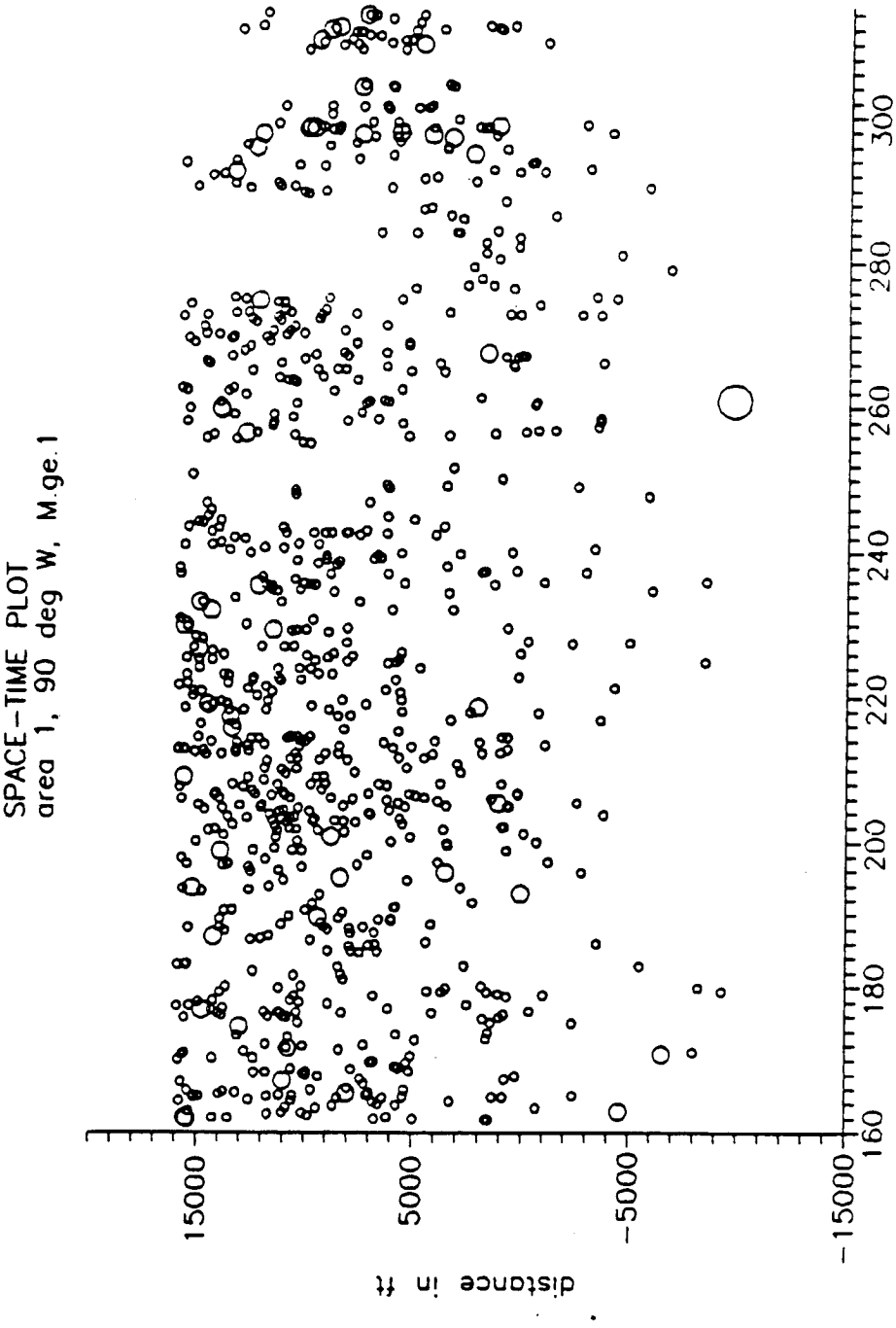

SPACE-TIME PLOT
area 1, 90 deg W, M.ge.1
distance in ft
15000
5000
-5000
-15000
160
180
200
220
240
260
280
300
Julian day

FIGURE 17b

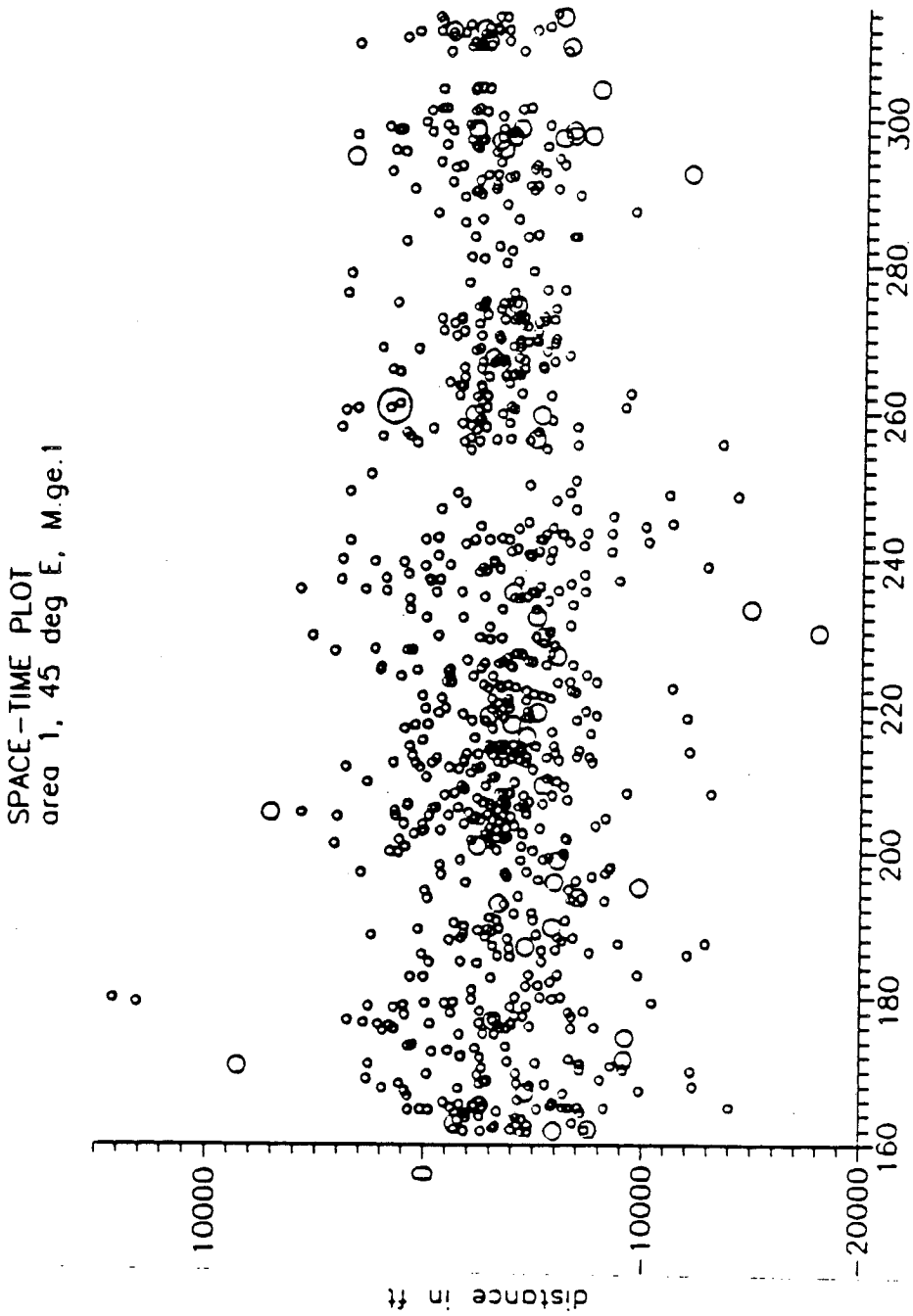

SPACE-TIME PLOT
area 1, 45 deg E, M.ge.1
distance in ft
10000
0
-10000
-20000
160
180
200
220
240
260
280
300
Julian day

FIGURE 17c

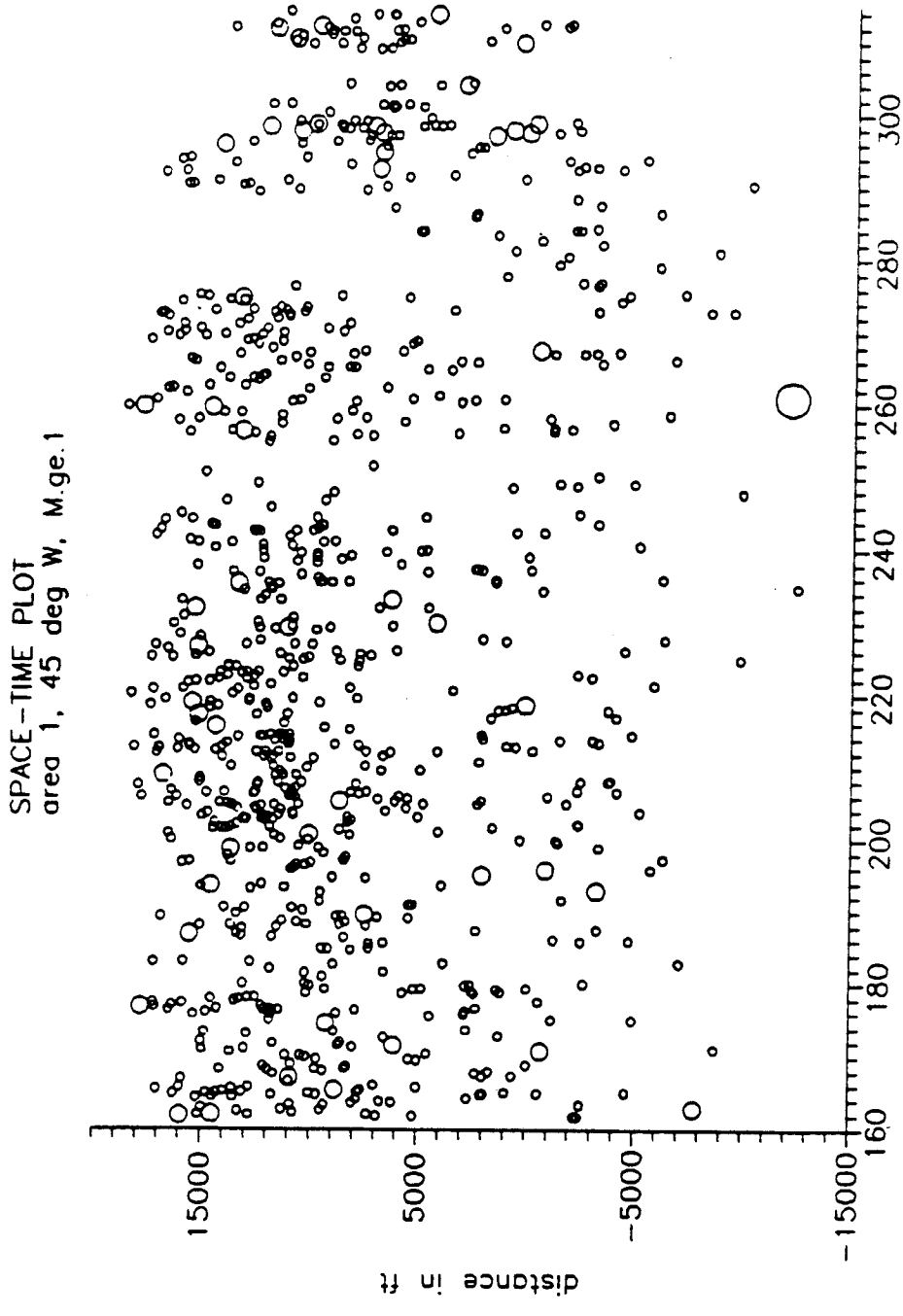

SPACE-TIME PLOT
area 1, 45 deg W, M.ge.1
distance in ft
15000
5000
-5000
-15000
160
180
200
220
240
260
280
300
Julian day

FIGURE 17d

Regional epicentral migration would maintain a fairly constant slope in the space-time plots, with events lined up at nearly the same angle for many cycles, which can overlap in time. The larger events are more likely to show such trends, and are plotted (M>2) in Figures 18a-d. There is no regional migrational trend apparent in the projections along east-west, northeast-southwest, or northwest-southeast, but in the north-south plot there is a hint of one from south to north. Events can be linked with a slope corresponding to about 56 km/yr (183 kft/yr), shown in Figure 19. According this interpretation, there were six migration sequences during the continuous first part of the data set, averaging 18 days apart. The south-to-north direction and the rate are not unreasonable in light of other estimates for migration of larger earthquakes in California (Savage, 1971; Ma and King, 1988).

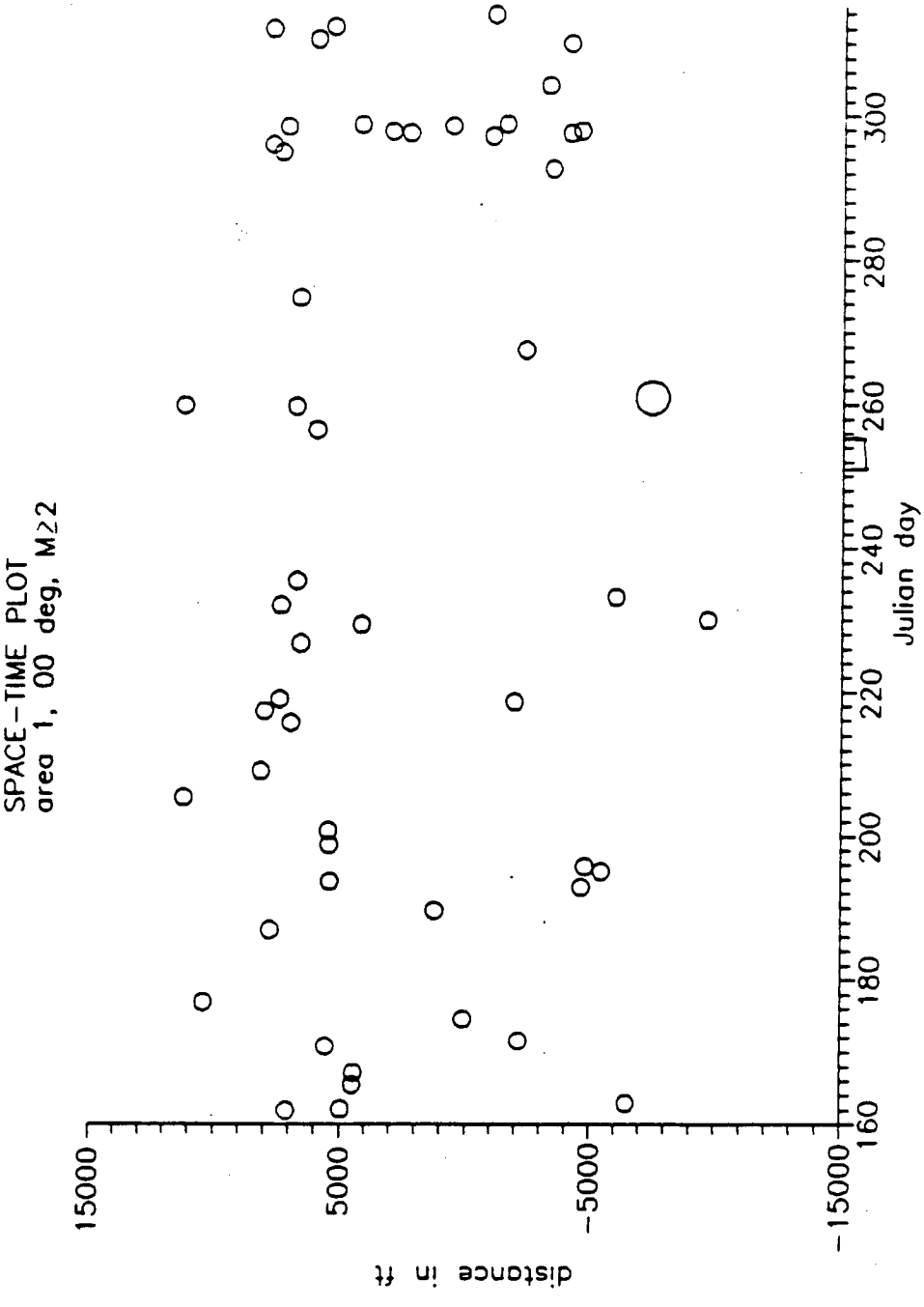

SPACE-TIME PLOT
area 1, 00 deg, M≥2
15000
5000
-5000
-15000
distance in ft
160
180
200
220
240
260
280
300
Julian day

FIGURE 18a

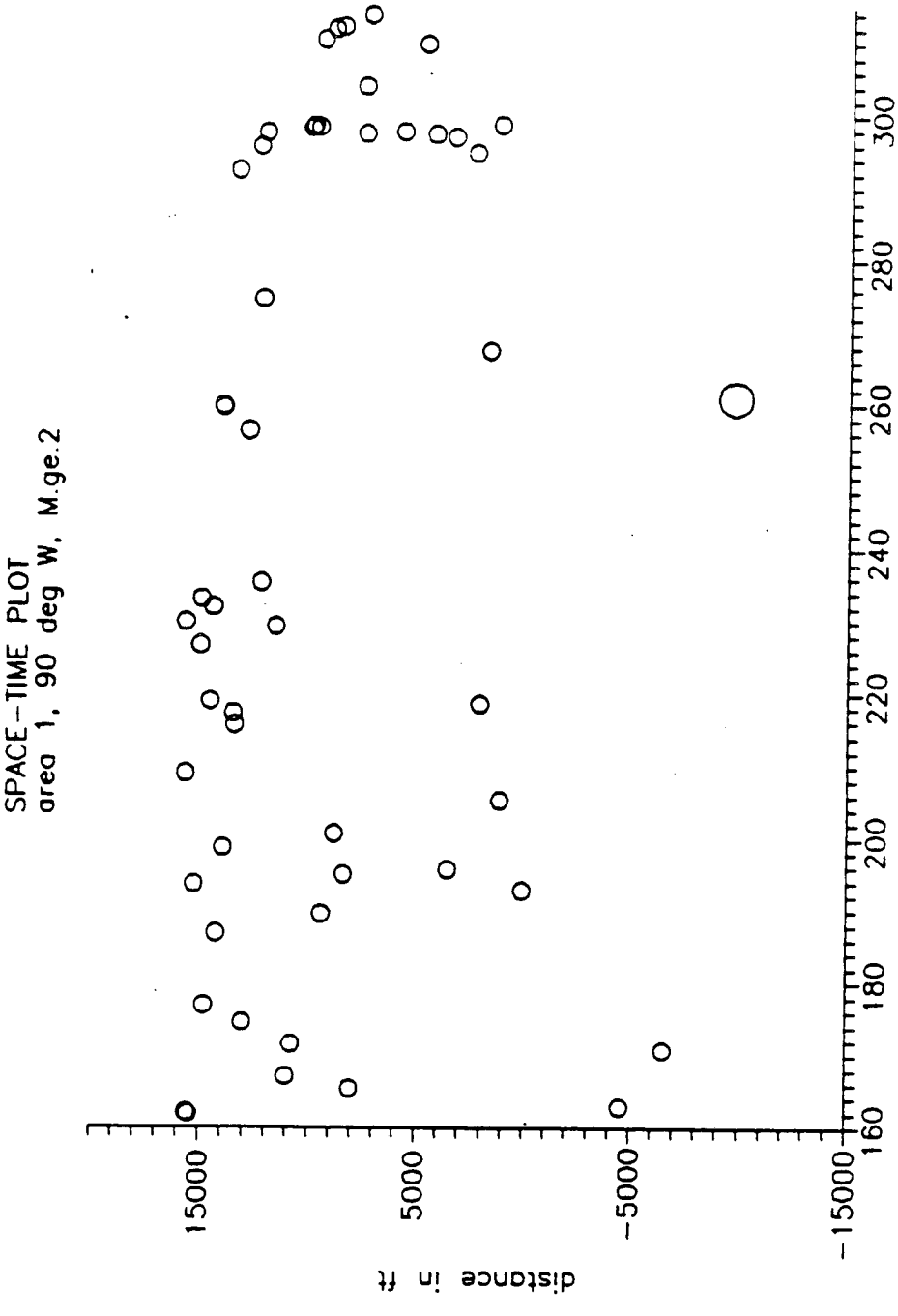

SPACE-TIME PLOT
area 1, 90 deg W, M.ge.2
distance in ft
15000
5000
-5000
-15000
160
180
200
220
240
260
280
300
Julian day

FIGURE 18b

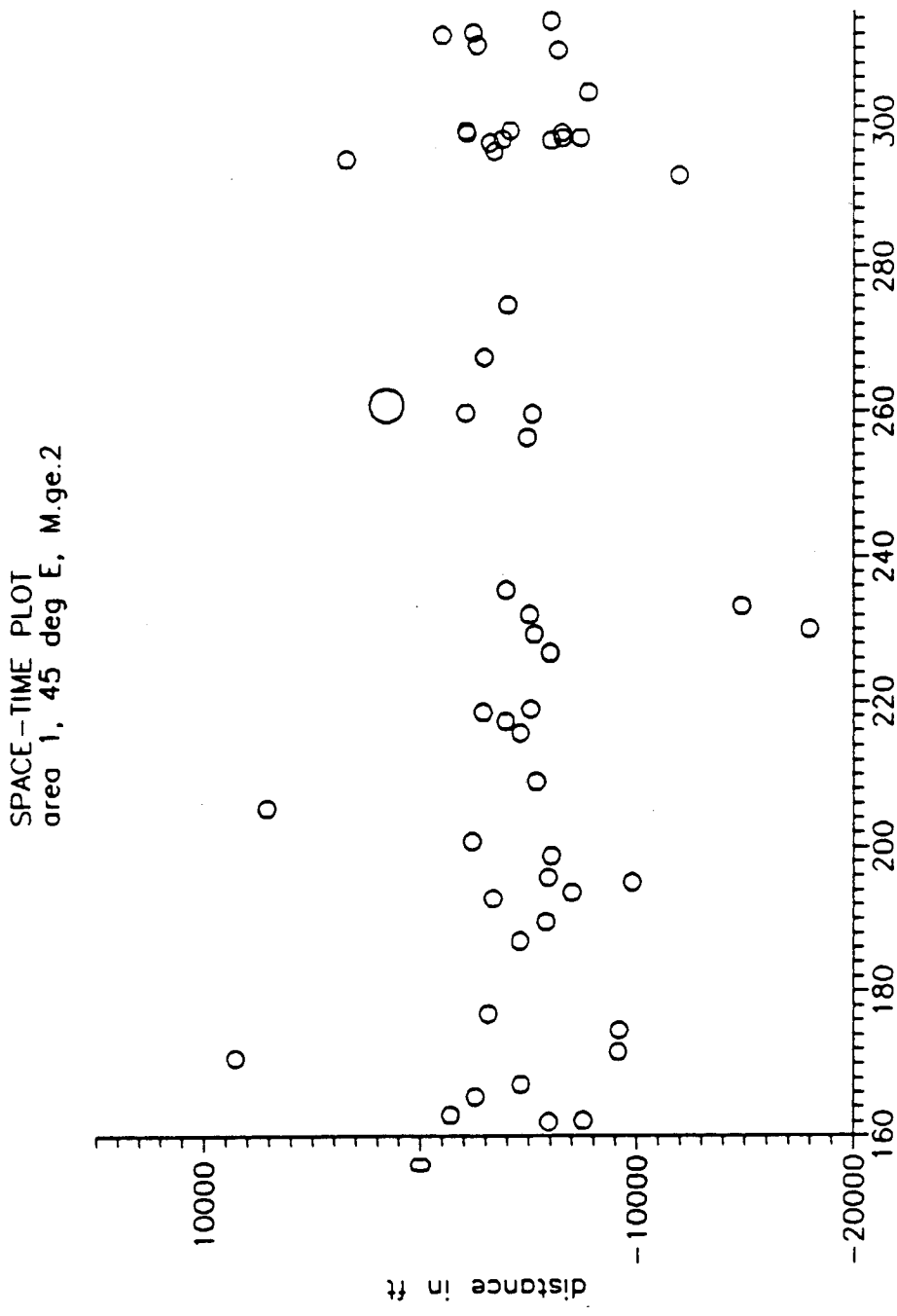

SPACE-TIME PLOT
area 1, 45 deg E, M.ge.2
distance in ft
10000
0
-10000
-20000
160
180
200
220
240
260
280
300
Julian day

FIGURE 18c

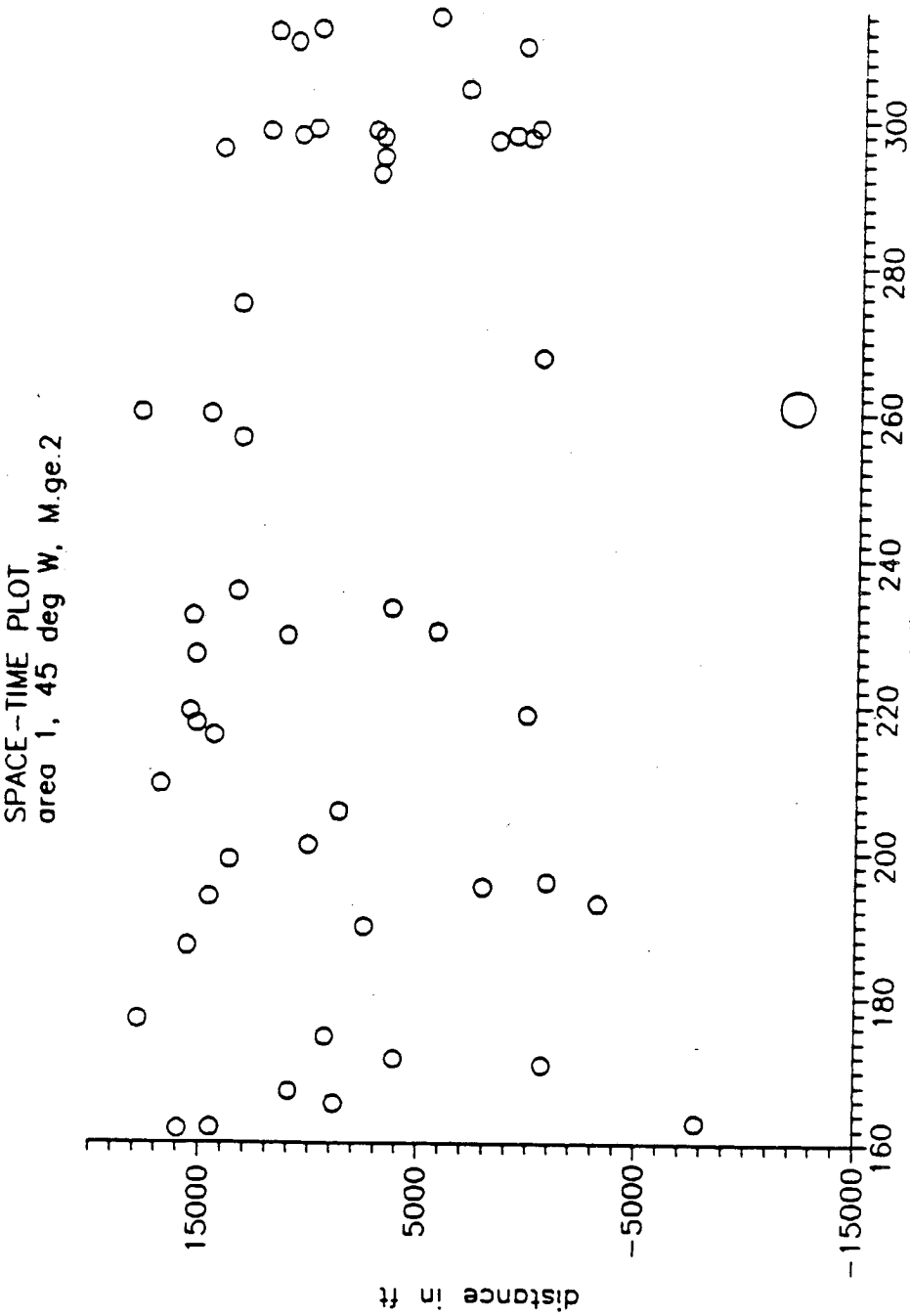

SPACE-TIME PLOT
area 1, 45 deg W, M.ge.2
distance in ft
15000
5000
-5000
-15000
160
180
200
220
240
260
280
300
Julian day

FIGURE 18d

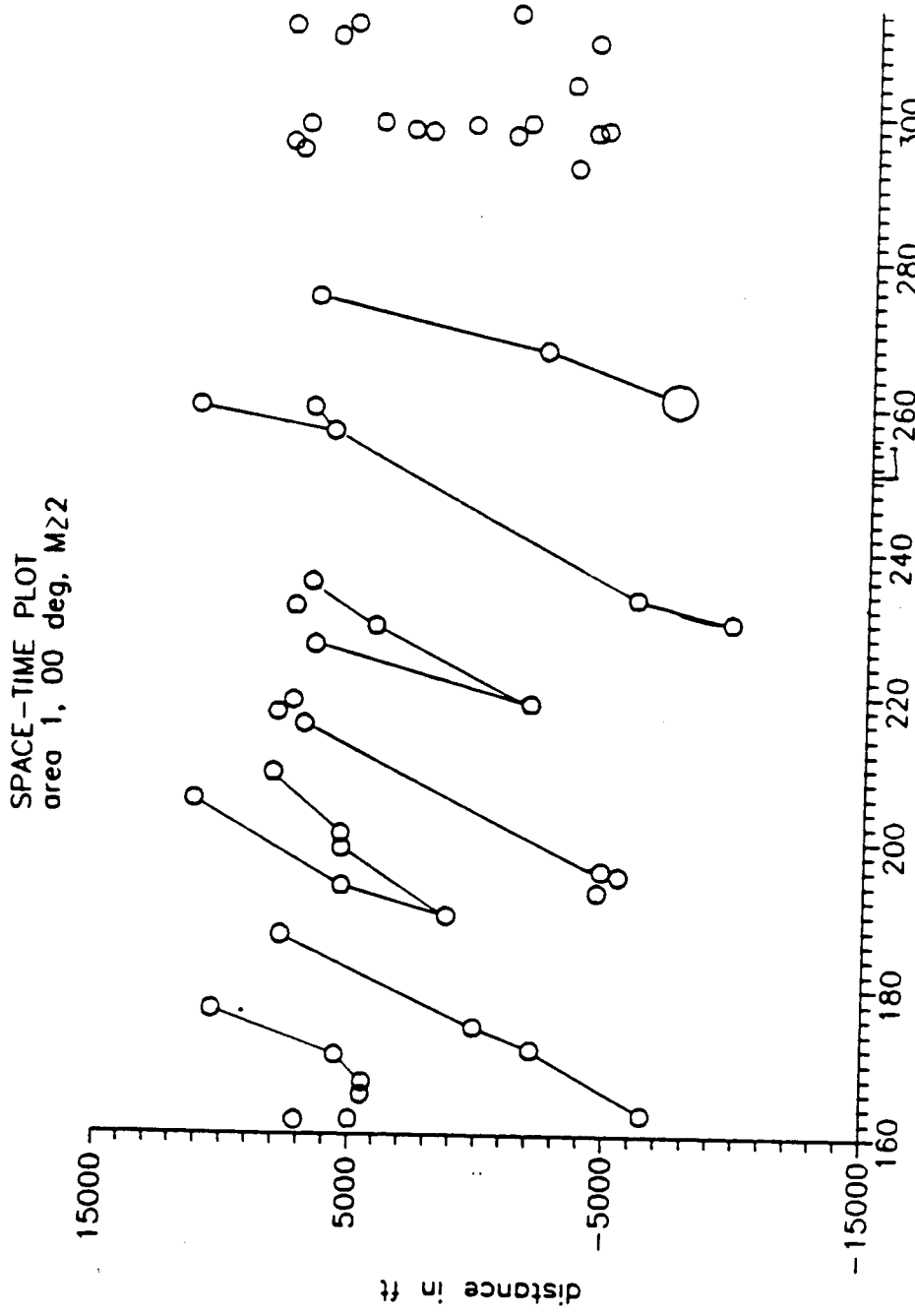

SPACE-TIME PLOT
area 1, 00 deg, M≥2
15000
5000
-5000
-15000
distance in ft
160
180
200
220
240
260
280
300
Julian day

FIGURE 19

CONCLUSIONS

Some interesting results have emerged from this project. The South Geysers area is relatively new to production, and there are differences in geology and reservoir characteristics between this area and the main Geysers. Seismicity in the two areas is different as a result. The rate here is lower, probably because of the shorter production duration. The earthquakes as a whole are deeper than the older area, which probably is not due to the velocity model, since the velocities are most likely on the low side. In the absence of well depth information, a comparison of production depths between the two areas cannot be made.

The greywacke reservoir rock is thinner in the South Geysers area than in the older parts of the field because the shallowest expression of the intrusive felsite unit underlies the study area and forms a lower boundary to the reservoir here. It is curious that the seismicity seems to be almost exclusively located within the felsite, whereas most extraction of steam is from the greywacke above.

With further study along several lines, important clues about the inducing mechanism may be found with this data set. A detailed look at the migration along the many fractures evident in the earthquake distribution may be traced to propagations of strain or pore pressure gradients which are related to steam extraction or water injection. It may even be possible to correlate these with known steam entries in wells. The temporal correlation between number of earthquakes and production parameters that change with time should be examined in detail, including possible reasons for periodicities. The reason that the earthquakes are more dense on one side of Sulphur Creek fault than the other might relate to differing fracture systems or facility of strain pulse propagation in the two areas. Other interesting features, such as the absence of events through the center of the array, and the depth extent and dome-shaped upper bound of the seismicity, might also be explanable with a more detailed look at the earthquakes in this report.

REFERENCES

Allis, R.G., 1982, "Mechanism of induced seismicity at The Geysers Geothermal Area, California", Geoph. Res. Letters, 9, 6, 629-632.

Beall, J.J., 1988, personal communications, Geysers Geothermal Co., Santa Rosa, Calif.

Brune, J.N., 1970, "Tectonic stress and spectra of seismic shear waves from earthquakes", J. Geoph. Res., 75, 4997-5009.

Brune, J.N., 1971, "Correction" (to Brune, 1970), J. Geoph. Res., 76, 5002.

Eberhart-Phillips, D. and Oppenheimer, D.H., 1984, "Induced seismicity in The Geysers Geothermal Area, California", J. Geoph. Res., 89, B2, 1191-1207.

Ludwin, R.S. and Bufe, C.G., 1980, "Continued seismic monitoring of the Geysers, California geothermal area", Open File Report 80-1060, U.S.G.S.

Ma, Z. and King, C., 1988, "Migration of historical earthquakes in California", in press, P.A. Geoph.

Majer, E.L. and McEvilly, T.V., 1979, "Seismological investigations at the Geysers Geothermal field", Geophs., 44, 2, 246-269.

Majer, E.L. and McEvilly, T.V., 1985, "Acoustic emission and wave propagation monitoring at the Spent Fuel Test: Climax, Nevada", Int. J. Rock Mech. Min. Sci. & Geomech. Abstr., 22, 4, 215-226.

McEvilly, T.V., and Majer, E.L., 1982, "ASP: An automated seismic processor for micro-earthquake networks", B.S.S.A., 72, 1, 303-325.

Oppenheimer, D.H., 1986, "Extensional tectonics at The Geysers Geothermal Area, California", J. Geoph. Res., 91, B11, 11463-11476.

Savage, J.C., 1971, "A theory of creep waves propagating along a transform fault", J. Geoph. Res., 76, 8, 1954-1966.

Stockton, A.D., et al, 1981, "A reservoir assessment of The Geysers Geothermal field", Calif. Dept of Cons., Publ. no. TR27.

APPENDIX A
EVENT LISTING WITH SOURCE PARAMETERS

SOUTH GEYSERS EARTHQUAKES: SOURCE PARAMETERS

DATE	TIME	# P PICKS	LOG MOMENT	RADIUS (CM)	STR DRP (BARS)	DISPL (CM)
87 610	1830	10	18.05	5608.8	2.9	0.400E-01
87 610	1836	10	18.14	5745.8	3.9	0.533E-01
87 610	2134	7	17.26	5355.8	0.5	0.122E-01
87 610	2140	9	18.86	9165.8	4.6	0.981E-01
87 610	2215	8	17.26	4407.5	1.2	0.211E-01
87 611	129	8	17.42	6538.0	0.3	0.592E-02
87 611	142	10	18.19	7657.0	3.3	0.472E-01
87 611	2 5	7	17.65	7756.4	0.5	0.757E-02
87 611	222	10	19.17	10644.9	6.5	0.678E-01
87 611	336	9	17.64	5656.1	1.0	0.113E-01
87 611	834	7	17.64	8476.6	0.4	0.810E-02
87 611	1354	8	18.10	8721.5	1.0	0.200E-01
87 611	1635	7	17.47	6134.0	0.9	0.147E-01
87 611	1857	7	17.59	6579.8	1.1	0.179E-01
87 611	2211	10	18.58	7450.3	5.5	0.923E-01
87 612	027	8	17.89	7700.7	0.9	0.152E-01
87 612	935	7	17.79	7326.2	0.7	0.123E-01
87 612	1011	6	17.21	5613.6	0.5	0.965E-02
87 612	1054	7	17.70	10372.0	0.3	0.609E-02
87 612	1522	5	17.99	8855.1	0.4	0.105E-01
87 612	1635	7	17.24	5551.9	0.5	0.108E-01
87 612	1726	6	17.05	4274.3	0.6	0.964E-02
87 612	1749	6	16.89	4386.5	0.4	0.874E-02
87 612	1753	8	17.08	3912.3	0.9	0.154E-01
87 612	1834	7	17.21	3984.2	0.9	0.163E-01
87 612	1938	7	16.93	5255.2	0.4	0.875E-02
87 612	1940	7	17.00	4217.8	0.6	0.124E-01
87 612	2114	10	17.91	5197.6	2.4	0.470E-01
87 612	22 8	5	16.94	4103.8	0.5	0.943E-02
87 612	2312	8	17.12	5520.0	0.4	0.789E-02
87 613	528	8	17.62	5491.4	1.2	0.289E-01
87 613	747	10	18.44	13118.8	0.6	0.117E-01
87 613	826	10	18.02	6918.3	1.5	0.239E-01
87 613	1058	7	17.63	7930.2	0.4	0.760E-02
87 613	1312	6	17.01	4448.2	1.1	0.193E-01
87 613	1320	8	18.41	7499.8	3.5	0.299E-01
87 613	1511	9	16.98	5234.3	0.3	0.482E-02
87 613	1923	9	17.85	8924.9	0.4	0.817E-02
87 613	1946	10	18.18	8467.5	1.2	0.245E-01
87 613	2052	7	17.47	7016.8	0.7	0.124E-01
87 613	2054	6	17.65	7272.8	0.6	0.117E-01
87 613	22 9	8	18.01	7300.4	1.1	0.182E-01
87 613	2317	9	17.78	5296.2	2.3	0.298E-01
87 614	026	7	17.53	5894.9	0.6	0.774E-02
87 614	029	9	18.05	6839.2	1.6	0.288E-01
87 614	119	8	17.84	7556.2	0.7	0.127E-01
87 614	217	9	18.24	6946.4	2.7	0.431E-01
87 614	314	5	18.29	10329.9	0.8	0.924E-02
87 614	4 6	5	17.68	6905.4	0.5	0.889E-02
87 614	439	7	17.34	4755.7	1.1	0.167E-01
87 614	8 3	8	18.14	6727.7	4.7	0.517E-01
87 614	1042	6	17.49	5844.0	0.6	0.118E-01
87 614	1052	6	18.95	9838.2	4.0	0.884E-01
87 614	1353	6	18.01	9146.2	0.4	0.899E-02
87 614	1740	0	18.01	9146.2	0.4	0.899E-02
87 614	1835	7	17.73	7475.4	0.5	0.942E-02
87 614	1958	6	16.75	4296.3	0.4	0.806E-02
87 614	2027	7	17.26	6534.2	0.5	0.851E-02
87 614	2053	9	17.89	5680.1	1.7	0.252E-01
87 615	3 2	9	18.11	7912.5	2.2	0.361E-01
87 615	1656	6	17.49	8704.2	0.2	0.758E-02
87 615	2321	7	17.12	4571.2	0.3	0.647E-02

87	615	2331	9	18.39	7188.3	2.3	0.456E-01
87	616	323	9	18.65	11896.9	2.3	0.366E-01
87	616	8 8	8	17.93	6984.7	0.8	0.155E-01
87	616	9 9	7	17.71	6741.8	1.1	0.172E-01
87	616	1734	8	18.01	10319.7	0.5	0.146E-01
87	616	1912	8	18.13	7677.4	0.8	0.189E-01
87	616	2332	7	17.43	4839.5	0.9	0.125E-01
87	617	212	9	18.30	9933.2	1.1	0.323E-01
87	617	7 2	8	18.14	14599.7	0.3	0.819E-02
87	617	734	6	17.53	6353.4	0.4	0.644E-02
87	617	9 6	9	18.28	13342.8	1.1	0.212E-01
87	617	10 7	8	17.89	6448.3	0.8	0.163E-01
87	617	1635	7	17.79	6529.9	1.0	0.233E-01
87	617	1825	8	17.52	6262.0	0.4	0.665E-02
87	617	2123	9	17.55	5571.1	0.9	0.140E-01
87	618	045	7	17.28	6136.1	0.4	0.622E-02
87	618	1359	8	17.49	5817.9	0.6	0.129E-01
87	618	17 5	8	17.86	10188.0	0.3	0.842E-02
87	618	1759	9	17.97	5320.2	2.7	0.466E-01
87	618	1940	5	16.52	3712.4	0.2	0.470E-02
87	619	1 4	8	17.63	6086.9	0.6	0.145E-01
87	619	341	5	16.75	3602.3	0.4	0.162E-01
87	619	538	9	18.20	7822.8	1.6	0.339E-01
87	619	539	9	17.57	5367.8	1.0	0.161E-01
87	619	651	5	16.69	3680.8	0.2	0.662E-02
87	619	1158	6	17.57	6534.0	0.7	0.154E-01
87	619	1738	7	17.58	5842.5	0.8	0.116E-01
87	619	1919	5	18.73	29637.9	0.1	0.608E-02
87	620	041	7	17.78	9497.2	0.4	0.771E-02
87	620	134	9	18.00	9372.5	1.2	0.190E-01
87	620	333	7	17.71	7264.7	0.5	0.971E-02
87	620	350	9	17.22	-4615.1	1.4	-.834E-01
87	620	845	8	17.21	5592.0	0.4	0.728E-02
87	620	1423	8	15.34	1321.1	0.4	0.105E+00
87	620	1424	8	18.91	16211.5	1.2	0.184E-01
87	620	1522	8	18.47	17458.1	0.6	0.174E-01
87	620	22 0	6	17.54	10621.1	0.2	0.401E-02
87	621	046	6	16.79	4407.2	0.3	0.824E-02
87	621	058	9	17.87	6860.2	1.1	0.208E-01
87	621	246	9	18.13	13616.9	0.3	0.910E-02
87	621	1727	8	17.38	5252.5	0.7	0.144E-01
87	621	2131	9	17.70	7427.7	0.4	0.774E-02
87	621	2312	5	16.22	5926.9	0.0	0.110E-02
87	622	430	8	18.18	6797.5	2.1	0.370E-01
87	622	941	8	17.80	7724.2	0.5	0.988E-02
87	622	12 1	8	17.75	6389.9	0.9	0.154E-01
87	622	1723	8	17.56	7514.7	0.4	0.785E-02
87	622	2013	6	16.83	5613.8	0.2	0.445E-02
87	622	2019	7	16.79	4576.7	0.3	0.613E-02
87	622	2356	7	17.01	6480.1	0.2	0.311E-02
87	623	726	6	17.13	6393.3	0.3	0.422E-02
87	623	1418	9	18.70	10189.4	3.6	0.547E-01
87	624	056	7	17.10	6893.1	0.1	0.263E-02
87	624	128	7	17.33	7809.1	0.4	0.619E-02
87	624	211	9	17.69	5892.4	1.1	0.182E-01
87	624	332	9	17.59	10806.4	0.2	0.418E-02
87	624	1622	7	17.07	5159.4	0.5	0.890E-02
87	624	1627	7	17.45	5735.2	0.4	0.705E-02
87	624	20 1	10	17.57	6176.7	0.6	0.956E-02
87	624	2018	9	17.61	6435.8	0.8	0.125E-01
87	624	2213	10	18.02	7915.8	1.0	0.189E-01
87	624	2242	10	18.29	6241.3	3.5	0.535E-01
87	624	2350	10	17.79	6040.8	1.3	0.248E-01
87	625	110	6	17.17	6376.1	0.2	0.366E-02
87	625	315	10	18.17	9490.2	0.8	0.152E-01
87	625	6 4	9	17.76	5929.4	1.2	0.179E-01

87 625	1047	9	18.23	7988.7	1.7	0.326E-01
87 625	1053	7	17.39	8081.9	0.2	0.350E-02
87 625	1114	7	17.49	7004.8	0.3	0.585E-02
87 625	1230	9	17.65	9637.0	0.2	0.518E-02
87 625	1248	8	17.52	6645.4	0.4	0.760E-02
87 625	15 6	9	17.45	6300.7	0.5	0.737E-02
87 625	1543	5	17.37	5736.1	0.5	0.671E-02
87 625	1713	9	17.99	7221.7	1.1	0.194E-01
87 625	1733	6	16.78	5891.4	0.1	0.318E-02
87 625	2218	6	17.12	5042.5	0.6	0.103E-01
87 625	2233	10	18.63	13759.5	2.0	0.460E-01
87 625	2243	8	17.81	7115.8	0.6	0.111E-01
87 626	114	9	18.09	7049.9	1.6	0.259E-01
87 626	410	7	17.70	6793.3	1.0	0.145E-01
87 626	1044	9	18.33	20462.4	0.1	0.529E-02
87 626	1321	9	17.79	11483.3	0.2	0.561E-02
87 626	1448	7	17.21	4607.2	0.9	0.147E-01
87 626	1737	10	18.38	7408.9	3.0	0.530E-01
87 626	19 5	7	17.05	5418.3	0.5	0.980E-02
87 626	1924	9	17.18	4943.5	0.7	0.105E-01
87 626	1944	5	16.53	4622.1	0.2	0.338E-02
87 627	014	9	17.57	8071.3	0.3	0.620E-02
87 627	040	9	17.75	5977.6	1.6	0.206E-01
87 627	519	8	18.19	11879.1	0.8	0.210E-01
87 627	537	8	18.02	8239.8	0.8	0.169E-01
87 627	1735	9	17.59	6758.4	0.7	0.968E-02
87 627	20 7	8	17.71	12407.8	0.1	0.358E-02
87 627	2058	8	17.44	5723.6	1.0	0.150E-01
87 627	22 4	6	17.69	11640.7	0.4	0.438E-02
87 628	035	7	17.09	5780.4	0.6	0.795E-02
87 628	222	9	17.75	6339.9	0.7	0.113E-01
87 628	837	7	17.74	6653.4	0.7	0.137E-01
87 628	845	8	18.08	8176.7	1.0	0.129E-01
87 628	931	6	17.69	7353.3	0.7	0.794E-02
87 628	1051	5	17.21	6166.5	0.3	0.387E-02
87 628	1123	6	17.30	6054.8	0.3	0.930E-02
87 628	1728	6	17.15	6430.7	0.4	0.655E-02
87 628	1744	7	17.16	5963.7	0.3	0.502E-02
87 628	1954	8	17.41	6628.8	0.4	0.677E-02
87 628	2029	9	17.06	6254.6	0.5	0.711E-02
87 628	2142	9	17.47	6208.3	0.6	0.101E-01
87 628	2325	6	17.63	6900.2	0.8	0.943E-02
87 629	140	6	17.53	6925.4	0.6	0.870E-02
87 629	238	9	17.58	5753.5	1.2	0.162E-01
87 629	315	7	17.42	5681.9	0.8	0.112E-01
87 629	348	8	17.64	7420.5	0.4	0.878E-02
87 629	2250	9	16.93	8498.1	0.2	0.267E-02
87 630	212	7	17.34	7799.3	0.3	0.283E-02
87 630	15 7	9	17.31	6503.2	0.3	0.465E-02
87 630	1827	9	18.01	7633.8	1.1	0.246E-01
87 7 1	614	6	17.36	6679.2	0.2	0.459E-02
87 7 1	19 7	9	17.92	6076.8	2.2	0.226E-01
87 7 1	2154	8	17.88	18942.7	0.0	0.220E-02
87 7 1	2241	8	18.02	7891.9	1.1	0.180E-01
87 7 2	254	9	17.93	6904.6	1.0	0.179E-01
87 7 2	420	9	18.31	9835.3	0.9	0.214E-01
87 7 2	520	9	17.81	7651.4	0.7	0.126E-01
87 7 2	2140	5	16.32	5981.1	0.1	0.189E-02
87 7 3	19 4	8	17.53	5178.0	1.4	0.203E-01
87 7 3	2156	7	17.72	8528.9	0.3	0.721E-02
87 7 4	019	9	18.08	6308.2	1.9	0.317E-01
87 7 4	035	9	17.99	8362.2	1.1	0.211E-01
87 7 4	1636	8	17.31	5207.6	0.7	0.113E-01
87 7 4	1840	9	17.49	8296.4	0.6	0.125E-01
87 7 4	2238	6	18.02	8645.9	0.7	0.919E-02
87 7 4	2354	9	18.11	6896.2	3.5	0.468E-01

87 7 5	324	6	16.34	3696.6	0.2	0.622E-02
87 7 5	339	8	17.16	5393.9	0.4	0.708E-02
87 7 5	341	6	16.85	5145.8	0.3	0.478E-02
87 7 5	519	8	17.32	5327.0	0.6	0.863E-02
87 7 5	1253	8	17.43	5649.4	0.8	0.127E-01
87 7 5	1512	8	17.86	12133.0	0.3	0.874E-02
87 7 5	1952	8	17.41	5774.2	0.9	0.129E-01
87 7 6	023	6	16.80	8154.0	0.2	0.294E-02
87 7 6	024	8	19.25	16089.9	1.9	0.412E-01
87 7 6	339	6	18.08	15847.4	0.3	0.844E-02
87 7 6	1045	8	18.07	7094.4	1.8	0.200E-01
87 7 6	1232	5	18.04	9107.3	0.9	0.121E-01
87 7 6	2043	7	17.62	7573.1	0.5	0.924E-02
87 7 7	045	8	17.44	8275.4	0.2	0.432E-02
87 7 7	327	8	17.77	7748.2	0.6	0.101E-01
87 7 7	542	9	18.00	9197.5	0.8	0.151E-01
87 7 7	638	9	17.53	7420.3	0.4	0.742E-02
87 7 7	656	6	17.42	6402.1	0.3	0.587E-02
87 7 7	846	9	17.66	7834.4	0.2	0.501E-02
87 7 7	1328	8	17.03	4726.1	0.6	0.905E-02
87 7 7	1329	8	17.09	5105.6	0.5	0.813E-02
87 7 7	16 3	5	17.35	4966.3	0.9	0.118E-01
87 7 7	1628	10	17.74	6598.1	0.7	0.120E-01
87 7 7	21 3	8	17.94	8051.6	1.2	0.195E-01
87 7 8	4 7	9	17.28	5807.9	0.5	0.878E-02
87 7 8	651	9	17.21	4719.6	0.6	0.101E-01
87 7 8	1110	9	18.28	9250.7	1.8	0.342E-01
87 7 8	1126	9	18.39	12485.4	1.0	0.237E-01
87 7 8	1255	9	17.34	7506.4	0.4	0.765E-02
87 7 8	1657	10	18.54	9489.5	2.3	0.271E-01
87 7 8	1714	5	15.99	3444.1	0.2	0.611E-02
87 7 8	2025	6	17.48	9198.2	0.1	0.362E-02
87 7 9	618	9	16.83	6109.0	0.3	0.521E-02
87 7 9	738	7	17.16	6124.5	0.4	0.532E-02
87 7 9	8 6	8	17.32	10846.6	0.2	0.402E-02
87 7 9	1359	6	16.95	5173.5	0.3	0.522E-02
87 7 9	1525	10	17.78	7926.8	0.6	0.114E-01
87 7 9	1545	10	18.40	10793.9	1.1	0.255E-01
87 7 9	1620	10	18.45	11322.3	1.7	0.361E-01
87 710	056	8	17.04	6178.3	0.3	0.478E-02
87 710	056	9	17.41	5882.8	0.6	0.108E-01
87 710	058	5	16.49	4771.2	0.1	0.274E-02
87 710	128	9	17.32	5563.4	0.6	0.106E-01
87 710	742	8	17.12	6072.2	0.3	0.501E-02
87 710	1018	7	17.57	8153.8	0.3	0.509E-02
87 710	1316	9	17.45	7359.6	0.4	0.696E-02
87 710	1539	10	17.67	6064.9	1.2	0.166E-01
87 710	1659	8	17.12	5323.3	0.4	0.768E-02
87 711	1914	9	17.23	6898.5	0.3	0.425E-02
87 711	2150	10	18.62	9626.3	1.8	0.197E-01
87 712	7 7	7	17.43	5519.0	0.8	0.104E-01
87 712	11 4	6	17.59	8234.5	0.5	0.771E-02
87 712	1515	10	18.37	11881.9	1.5	0.213E-01
87 712	1717	10	17.74	8527.7	0.5	0.126E-01
87 712	1717	6	19.58	20884.6	2.0	0.155E-01
87 712	22 9	7	18.02	8530.3	1.1	0.101E-01
87 713	1630	9	17.56	5867.7	1.2	0.152E-01
87 713	1930	8	17.77	9689.7	0.3	0.607E-02
87 713	1945	5	15.82	1862.5	0.5	0.304E-01
87 714	252	9	18.56	9567.8	1.9	0.184E-01
87 714	1932	10	18.88	11628.5	1.9	0.215E-01
87 714	1937	6	17.85	10617.4	0.6	0.103E-01
87 714	2354	9	17.77	6135.0	1.1	0.163E-01
87 715	343	7	17.50	5538.2	0.8	0.112E-01
87 715	454	9	18.13	7936.3	1.6	0.262E-01
87 715	734	5	16.91	8510.0	0.1	0.231E-02

87 715	1427	5	17.54	6188.6	2.0	0.137E-01
87 715	15 2	10	17.86	6326.2	1.3	0.187E-01
87 715	1614	10	18.17	8634.2	1.1	0.205E-01
87 715	1913	5	16.10	3367.6	0.1	0.387E-02
87 715	2020	7	16.99	5854.3	0.2	0.437E-02
87 715	2137	6	17.51	9195.1	0.2	0.412E-02
87 715	2146	10	17.70	6340.8	0.8	0.125E-01
87 715	2354	7	17.14	5119.6	0.4	0.632E-02
87 716	114	5	16.98	5272.7	0.3	0.597E-02
87 716	128	10	18.33	8579.9	3.2	0.511E-01
87 716	2 3	8	17.12	5425.0	0.4	0.532E-02
87 716	239	7	17.88	10455.3	0.3	0.863E-02
87 716	514	8	17.93	8515.8	0.5	0.112E-01
87 716	555	7	17.90	8102.4	0.9	0.157E-01
87 716	1643	9	17.81	6095.3	1.3	0.219E-01
87 716	2052	9	17.89	6812.1	1.0	0.172E-01
87 717	523	8	17.68	7159.7	1.0	0.171E-01
87 717	1939	7	18.62	12400.0	1.0	0.231E-01
87 717	2027	9	17.79	8871.4	1.2	0.179E-01
87 717	2120	7	17.64	7091.6	0.6	0.100E-01
87 717	2246	7	17.57	6322.7	0.9	0.127E-01
87 717	2246	7	17.67	5910.9	1.3	0.202E-01
87 718	523	9	18.03	8875.7	2.4	0.346E-01
87 718	1254	8	18.00	6099.6	1.3	0.219E-01
87 718	2015	8	17.22	5580.7	0.5	0.680E-02
87 719	0 6	8	17.45	8643.9	0.2	0.478E-02
87 719	136	7	17.78	8482.9	0.3	0.707E-02
87 719	316	6	17.98	8895.8	0.5	0.113E-01
87 719	516	7	17.78	6898.4	0.8	0.148E-01
87 719	1240	6	16.87	4390.9	0.6	0.728E-02
87 719	1330	4	16.75	6956.3	0.1	0.326E-02
87 719	17 5	8	17.70	9413.2	0.2	0.614E-02
87 719	1727	6	17.34	5253.7	0.7	0.851E-02
87 719	1832	5	16.96	4923.5	0.3	0.586E-02
87 719	19 5	6	18.68	11517.7	2.9	0.196E-01
87 719	2359	8	17.70	7314.8	0.7	0.112E-01
87 720	010	9	17.71	4799.3	3.8	0.327E-01
87 720	1 0	5	17.49	7605.8	0.3	0.639E-02
87 720	217	7	17.00	4741.5	1.0	0.944E-02
87 720	319	8	17.25	7322.9	0.3	0.611E-02
87 720	615	7	17.02	7174.8	0.3	0.463E-02
87 720	1046	7	17.30	6295.6	0.4	0.465E-02
87 720	15 0	6	17.53	6428.4	0.4	0.747E-02
87 720	16 1	9	18.06	8763.1	1.0	0.189E-01
87 720	1615	7	17.58	7695.9	0.7	0.163E-01
87 720	1724	9	17.70	9773.9	0.2	0.761E-02
87 720	2019	10	17.95	6554.6	1.3	0.238E-01
87 720	2026	10	18.00	7477.6	1.2	0.220E-01
87 720	2226	10	17.93	10259.1	0.3	0.770E-02
87 721	2 2	9	17.47	6197.5	0.5	0.817E-02
87 721	244	10	17.88	9295.7	0.9	0.156E-01
87 721	622	6	17.22	8411.8	0.1	0.216E-02
87 721	1027	8	17.17	5713.9	0.4	0.702E-02
87 721	1043	10	18.01	8802.0	0.7	0.126E-01
87 721	1141	9	18.20	5896.2	4.5	0.691E-01
87 721	1814	7	17.21	6013.9	0.4	0.785E-02
87 721	20 4	9	18.25	13092.7	0.8	0.241E-01
87 721	2154	8	17.33	8457.0	0.2	0.488E-02
87 721	2348	8	17.42	7417.9	0.3	0.590E-02
87 722	0 3	6	17.58	6508.2	1.6	0.147E-01
87 722	1 2	9	17.80	14118.8	0.1	0.347E-02
87 722	440	8	17.27	4309.4	1.0	0.157E-01
87 722	451	8	17.15	5266.9	0.7	0.969E-02
87 722	452	9	17.59	5626.3	0.8	0.147E-01
87 722	650	9	17.91	7564.0	0.9	0.175E-01
87 722	859	7	17.47	10862.2	0.1	0.291E-02

87 722	938	8	17.52	7440.7	0.3	0.552E-02
87 722	11 3	6	17.00	7535.5	0.1	0.190E-02
87 722	1239	8	17.84	7296.7	0.7	0.113E-01
87 722	1310	8	17.22	6432.5	0.4	0.620E-02
87 722	1830	6	16.82	4312.6	0.3	0.617E-02
87 722	19 5	10	18.11	6859.1	1.9	0.227E-01
87 722	1941	9	17.74	6239.6	1.0	0.144E-01
87 722	20 3	9	18.05	11721.8	0.6	0.132E-01
87 723	034	5	17.23	5669.2	0.5	0.619E-02
87 723	343	7	16.91	5914.0	0.2	0.262E-02
87 723	6 4	8	17.11	8762.7	0.1	0.191E-02
87 723	6 6	6	16.98	5074.2	0.3	0.631E-02
87 723	648	8	17.51	7351.2	0.4	0.770E-02
87 723	7 0	9	17.98	7446.3	1.0	0.185E-01
87 723	817	7	17.15	6186.1	0.3	0.491E-02
87 723	834	7	17.14	5468.8	0.5	0.681E-02
87 723	933	9	17.85	6623.6	1.4	0.224E-01
87 723	1042	7	17.50	8333.9	0.2	0.433E-02
87 723	1354	10	18.14	9674.0	0.9	0.199E-01
87 723	1724	5	16.83	4736.3	0.3	0.546E-02
87 723	18 5	8	17.71	8204.3	0.4	0.893E-02
87 723	1847	10	17.90	7616.1	0.7	0.130E-01
87 723	2011	9	18.12	13198.9	0.3	0.681E-02
87 723	2031	7	17.78	9796.5	0.3	0.592E-02
87 723	2135	6	16.75	3817.7	0.5	0.763E-02
87 723	2148	9	17.71	7104.6	0.6	0.108E-01
87 723	2253	6	17.36	6652.2	0.3	0.579E-02
87 723	2335	10	17.82	6256.6	1.5	0.216E-01
87 723	2344	9	18.02	13937.2	0.2	0.534E-02
87 724	1 0	5	16.50	6316.5	0.1	0.150E-02
87 724	144	5	16.26	5041.6	0.1	0.142E-02
87 724	258	10	17.80	7572.4	0.8	0.143E-01
87 724	456	9	18.09	9788.5	0.5	0.131E-01
87 724	457	8	17.96	8373.7	0.5	0.114E-01
87 724	858	6	17.65	7456.6	0.4	0.625E-02
87 724	925	5	18.54	11621.2	0.9	0.776E-02
87 724	946	5	17.83	13984.9	0.2	0.480E-02
87 724	1243	9	17.93	11851.4	0.3	0.827E-02
87 724	15 5	10	18.14	20425.7	0.1	0.655E-02
87 724	1739	9	18.08	9143.1	0.7	0.195E-01
87 724	1825	8	17.50	9498.9	0.4	0.595E-02
87 724	2254	9	17.48	5070.3	0.9	0.155E-01
87 724	23 8	7	16.78	4504.7	0.2	0.437E-02
87 724	2342	8	17.41	9537.2	0.4	0.627E-02
87 725	120	9	18.05	6880.3	1.3	0.234E-01
87 725	146	7	17.22	7799.8	0.2	0.303E-02
87 725	225	10	17.44	9140.5	0.7	0.158E-01
87 725	240	9	17.97	8930.4	0.9	0.167E-01
87 725	247	6	17.35	6046.3	0.9	0.103E-01
87 725	835	7	17.25	5294.4	0.4	0.621E-02
87 725	1122	10	17.94	11593.0	1.1	0.191E-01
87 725	1311	8	17.73	6823.8	1.0	0.105E-01
87 725	1338	7	17.24	13755.8	0.1	0.278E-02
87 725	14 1	6	17.58	6758.3	0.6	0.815E-02
87 725	1425	7	17.22	5334.2	0.5	0.685E-02
87 725	15 4	9	18.08	10516.9	0.5	0.137E-01
87 725	1611	9	17.55	11864.0	0.5	0.572E-02
87 725	1738	10	17.67	5909.7	0.9	0.158E-01
87 725	1814	8	16.68	5709.5	0.2	0.216E-02
87 725	2030	10	18.39	9290.0	1.5	0.341E-01
87 725	2135	7	17.69	7659.5	0.5	0.919E-02
87 725	22 6	8	17.08	5329.1	0.6	0.604E-02
87 726	245	10	18.44	12532.3	1.0	0.238E-01
87 726	528	7	17.31	6311.0	0.4	0.769E-02
87 726	550	5	16.56	4344.8	0.2	0.307E-02
87 726	1530	6	17.17	7554.2	0.2	0.344E-02

87 726	1542	10	18.30	12779.8	0.5	0.115E-01
87 726	16 5	10	17.61	13544.8	0.1	0.379E-02
87 726	18 6	7	17.49	7872.5	0.2	0.406E-02
87 726	19 5	5	16.05	8365.7	0.0	0.686E-03
87 726	2252	7	17.30	6471.0	0.4	0.608E-02
87 726	2322	6	17.56	7943.8	0.3	0.610E-02
87 726	2352	5	18.05	12054.0	0.5	0.486E-02
87 727	017	10	17.85	7934.6	0.8	0.151E-01
87 727	110	6	17.41	10049.3	0.1	0.284E-02
87 727	144	8	17.81	9094.3	0.5	0.956E-02
87 727	2 8	5	17.74	7633.9	0.7	0.691E-02
87 727	1250	8	17.06	5361.5	0.5	0.906E-02
87 727	1257	6	16.94	5541.5	0.4	0.680E-02
87 727	1441	10	18.17	10055.9	0.7	0.179E-01
87 727	2218	8	17.37	6812.6	0.3	0.671E-02
87 727	23 2	6	17.16	6106.3	0.2	0.524E-02
87 728	010	6	17.23	6350.5	0.3	0.720E-02
87 728	026	9	17.70	11139.7	0.2	0.576E-02
87 728	159	8	18.69	10468.9	2.5	0.567E-01
87 728	220	7	17.10	5553.4	0.5	0.571E-02
87 728	738	6	16.97	5989.3	0.1	0.347E-02
87 728	1214	9	18.16	7543.6	1.2	0.248E-01
87 728	1415	8	18.05	17707.5	0.6	0.486E-02
87 728	1538	10	18.13	8098.4	2.4	0.412E-01
87 728	1645	5	16.86	7775.3	0.1	0.207E-02
87 728	2021	8	16.86	5203.2	0.3	0.568E-02
87 729	129	6	17.64	9421.6	0.2	0.426E-02
87 729	459	9	17.98	7887.8	0.7	0.133E-01
87 729	538	7	17.54	7365.7	0.6	0.943E-02
87 729	624	9	17.81	13485.6	0.4	0.128E-01
87 729	19 4	9	17.77	9866.6	0.5	0.145E-01
87 730	217	5	16.10	4716.2	0.2	0.528E-02
87 730	532	9	18.01	7890.3	1.0	0.189E-01
87 730	758	8	17.29	7371.6	0.2	0.324E-02
87 730	944	8	17.44	6148.5	0.7	0.110E-01
87 730	13 2	8	17.45	8937.9	0.2	0.444E-02
87 730	1327	7	17.71	8824.1	0.3	0.673E-02
87 730	1412	9	17.52	10572.2	0.3	0.787E-02
87 730	1514	10	18.13	8592.5	0.8	0.166E-01
87 730	1535	5	17.57	6241.9	0.7	0.667E-02
87 730	1739	6	17.55	9679.7	0.3	0.441E-02
87 731	3 5	5	17.31	7749.2	0.3	0.626E-02
87 731	427	9	18.23	8558.8	1.4	0.289E-01
87 731	543	6	16.88	5259.3	0.2	0.369E-02
87 731	616	7	17.98	8954.9	0.7	0.163E-01
87 731	617	8	17.69	11243.8	0.2	0.463E-02
87 731	619	7	17.65	12660.4	0.1	0.503E-02
87 731	621	7	16.26	3769.6	0.2	0.306E-02
87 731	632	9	17.99	6491.1	2.0	0.298E-01
87 731	634	5	16.78	4548.4	0.5	0.531E-02
87 731	634	6	17.32	6387.9	0.3	0.500E-02
87 731	735	7	17.25	5565.0	0.4	0.463E-02
87 731	828	5	16.72	6248.4	0.1	0.198E-02
87 731	1120	7	16.83	7468.3	0.1	0.165E-02
87 731	1156	8	17.75	6028.6	1.1	0.169E-01
87 731	1246	10	18.00	11553.9	0.3	0.822E-02
87 731	15 1	9	17.53	9336.5	0.3	0.628E-02
87 731	1812	9	18.02	12440.5	0.2	0.699E-02
87 731	1951	9	16.99	4723.5	0.5	0.638E-02
87 731	2015	9	18.06	11482.5	0.5	0.101E-01
87 731	21 9	7	17.54	6591.9	0.4	0.636E-02
87 731	22 8	9	17.65	11384.0	0.1	0.410E-02
87 731	2229	7	17.19	6096.5	0.4	0.687E-02
87 731	2245	7	17.20	7714.3	0.2	0.334E-02
87 731	2331	10	17.02	7422.7	0.3	0.621E-02
87 731	2357	8	17.68	38509.0	0.0	0.258E-03

87 8 1	044	7	16.43	6221.2	0.1	0.161E-02
87 8 1	057	9	17.56	6860.2	0.6	0.922E-02
87 8 1	355	8	17.48	5939.2	0.5	0.794E-02
87 8 1	556	9	17.83	7857.4	0.5	0.941E-02
87 8 1	7 7	7	17.37	7157.9	0.3	0.481E-02
87 8 1	834	9	17.93	7908.2	0.6	0.129E-01
87 8 1	929	7	17.25	6992.0	0.2	0.431E-02
87 8 1	1156	7	17.76	9687.6	0.3	0.717E-02
87 8 1	1217	9	17.52	5925.0	0.7	0.109E-01
87 8 1	1245	8	17.18	6555.9	0.2	0.377E-02
87 8 1	1649	6	17.01	6190.6	0.2	0.432E-02
87 8 1	1712	5	18.14	10212.4	0.5	0.612E-02
87 8 1	1733	10	18.03	6759.8	1.4	0.252E-01
87 8 1	1950	8	17.47	6813.1	0.5	0.686E-02
87 8 1	2136	8	17.12	5831.0	0.2	0.365E-02
87 8 1	2215	8	17.65	6651.2	1.1	0.142E-01
87 8 1	2310	6	17.45	13190.1	0.1	0.188E-02
87 8 1	2312	10	17.39	8019.7	0.3	0.837E-02
87 8 1	2340	8	17.56	7385.3	0.4	0.792E-02
87 8 2	429	8	17.05	4988.5	0.4	0.662E-02
87 8 2	815	8	16.94	4951.0	0.4	0.615E-02
87 8 2	819	7	17.21	15261.1	0.0	0.103E-02
87 8 2	911	9	17.78	7308.6	0.9	0.153E-01
87 8 2	915	8	17.47	6058.3	0.8	0.125E-01
87 8 2	1032	6	17.98	6775.8	1.2	0.141E-01
87 8 2	1141	7	17.15	6241.9	0.3	0.479E-02
87 8 2	1147	9	17.25	4711.8	0.7	0.923E-02
87 8 2	1257	7	16.98	5100.7	0.6	0.790E-02
87 8 2	1321	9	18.09	8875.1	1.9	0.298E-01
87 8 2	1342	8	17.23	7760.8	0.2	0.398E-02
87 8 2	1414	7	17.75	6329.8	0.8	0.135E-01
87 8 2	1417	9	17.87	8804.3	0.9	0.146E-01
87 8 2	1422	7	17.38	7905.4	0.3	0.457E-02
87 8 2	1427	5	17.06	6397.1	0.2	0.350E-02
87 8 2	2213	6	16.32	3953.1	0.2	0.482E-02
87 8 3	647	8	17.56	6103.9	0.7	0.118E-01
87 8 3	14 0	7	17.33	6570.6	0.5	0.905E-02
87 8 3	1846	9	18.96	19401.2	0.5	0.188E-01
87 8 4	4 1	9	18.05	6483.6	2.2	0.345E-01
87 8 4	9 3	8	18.33	10107.1	1.1	0.236E-01
87 8 4	1919	10	17.76	7398.4	1.1	0.233E-01
87 8 4	2053	10	17.52	5592.1	1.0	0.134E-01
87 8 5	446	6	17.15	6048.9	0.4	0.627E-02
87 8 5	634	7	17.15	5388.0	0.9	0.148E-01
87 8 5	853	6	17.23	8141.2	0.4	0.555E-02
87 8 5	10 2	10	18.54	16312.0	1.0	0.270E-01
87 8 5	1053	7	17.53	12527.4	0.1	0.257E-02
87 8 5	11 5	7	17.18	5666.5	0.3	0.553E-02
87 8 5	1214	5	17.18	5555.8	0.5	0.541E-02
87 8 5	1351	7	16.99	5099.7	0.4	0.481E-02
87 8 5	1942	10	17.95	7908.2	0.7	0.145E-01
87 8 5	22 2	10	17.34	6600.6	0.3	0.955E-02
87 8 5	2333	6	17.71	6262.7	0.9	0.139E-01
87 8 6	655	5	17.27	5840.4	0.6	0.801E-02
87 8 6	753	8	18.39	9220.1	1.2	0.284E-01
87 8 6	754	6	17.51	6344.7	0.7	0.137E-01
87 8 6	755	5	17.26	5814.8	0.3	0.531E-02
87 8 6	833	6	16.79	6176.2	0.1	0.223E-02
87 8 6	1528	10	18.27	9101.5	1.1	0.240E-01
87 8 6	1529	10	18.59	12494.0	1.3	0.342E-01
87 8 6	1649	8	17.18	5112.8	1.0	0.109E-01
87 8 6	1811	9	17.80	8179.6	0.5	0.101E-01
87 8 6	1941	10	18.07	9077.4	0.7	0.173E-01
87 8 6	2110	5	16.53	4262.5	0.3	0.408E-02
87 8 6	2354	10	18.13	12480.3	0.3	0.103E-01
87 8 7	129	10	18.50	10936.1	1.7	0.376E-01

87 8 7	240	6	16.86	8609.2	0.1	0.236E-02
87 8 7	426	6	18.27	14587.5	0.5	0.131E-01
87 8 7	456	9	17.63	6230.2	0.9	0.138E-01
87 8 7	1239	9	18.13	9805.9	0.6	0.111E-01
87 8 7	1334	9	17.96	6934.7	1.8	0.267E-01
87 8 7	1351	7	17.28	8056.3	0.1	0.333E-02
87 8 7	1459	8	17.50	7669.6	0.3	0.619E-02
87 8 8	7 6	10	17.87	8946.3	1.0	0.165E-01
87 8 8	823	9	17.69	8172.0	0.5	0.803E-02
87 8 8	1614	5	17.22	6244.7	0.4	0.520E-02
87 8 8	1637	6	16.58	3935.0	0.4	0.542E-02
87 8 8	21 7	8	17.76	7615.2	0.5	0.105E-01
87 8 8	2132	8	17.43	8788.6	0.1	0.345E-02
87 8 8	2141	6	16.52	3870.8	0.3	0.490E-02
87 8 8	2310	9	17.87	11226.7	0.3	0.820E-02
87 8 9	046	8	17.41	7808.5	0.5	0.110E-01
87 8 9	221	5	16.87	6290.3	0.3	0.456E-02
87 8 9	640	8	17.65	8237.7	0.4	0.947E-02
87 8 9	750	9	17.78	8876.4	0.9	0.104E-01
87 8 9	1318	9	18.24	10706.5	1.0	0.217E-01
87 8 9	1529	8	16.97	4951.4	0.4	0.678E-02
87 8 9	1843	9	17.84	7715.7	0.8	0.152E-01
87 8 9	2217	6	17.15	7101.3	0.2	0.356E-02
87 810	1 4	9	18.19	8162.8	1.1	0.229E-01
87 810	114	9	18.11	14000.3	0.2	0.719E-02
87 810	216	6	17.18	5125.2	0.4	0.615E-02
87 810	828	8	17.84	11660.0	0.2	0.520E-02
87 810	927	10	17.84	8294.3	1.4	0.231E-01
87 810	949	9	18.10	8158.1	1.3	0.228E-01
87 810	1036	7	16.83	7795.3	0.2	0.384E-02
87 810	1138	7	17.50	6111.0	0.8	0.968E-02
87 810	17 1	10	18.45	9867.5	1.3	0.308E-01
87 810	1940	9	17.64	6846.8	0.6	0.112E-01
87 810	1945	10	18.41	10408.3	1.8	0.382E-01
87 810	2134	8	17.12	6572.9	0.2	0.606E-02
87 810	2340	8	15.27	1140.2	0.5	0.704E-01
87 811	213	8	17.44	6817.3	0.6	0.983E-02
87 811	442	10	18.40	13165.0	2.5	0.407E-01
87 811	510	10	18.29	20170.2	0.2	0.765E-02
87 811	527	10	18.04	11787.5	1.2	0.190E-01
87 811	659	8	17.72	12214.2	0.9	0.114E-01
87 811	939	9	16.46	2490.1	0.8	0.261E-01
87 811	19 0	6	16.94	6652.3	0.1	0.186E-02
87 811	2051	8	16.98	6942.7	0.2	0.441E-02
87 811	2347	9	17.78	10617.4	0.2	0.588E-02
87 812	011	6	17.42	6893.0	0.4	0.572E-02
87 812	055	9	17.61	5817.8	1.0	0.146E-01
87 812	1 3	9	17.61	7820.8	0.4	0.779E-02
87 812	429	9	17.77	9197.1	0.4	0.863E-02
87 812	1748	8	17.32	11030.4	0.1	0.441E-02
87 812	19 5	8	16.81	4213.2	0.6	0.108E-01
87 812	2052	5	17.07	6342.8	0.3	0.689E-02
87 812	2057	10	17.96	5870.1	1.6	0.285E-01
87 812	2121	6	17.73	8204.9	0.5	0.962E-02
87 812	23 6	6	17.17	5273.4	0.4	0.822E-02
87 812	2334	9	18.29	14747.5	0.3	0.104E-01
87 813	326	9	17.66	8269.3	0.4	0.761E-02
87 813	641	9	17.56	12384.0	0.1	0.225E-02
87 813	7 7	6	17.53	6985.8	0.6	0.961E-02
87 813	10 7	8	17.72	6668.9	1.0	0.154E-01
87 813	1320	6	17.48	12550.5	0.1	0.280E-02
87 813	1323	10	18.14	13776.5	0.7	0.174E-01
87 813	1819	8	17.31	6080.3	0.8	0.145E-01
87 813	1859	7	17.49	6576.7	0.5	0.766E-02
87 813	1938	7	17.03	5534.7	0.3	0.559E-02
87 813	2150	6	16.60	4154.0	0.3	0.472E-02

87	814	011	8	17.07	4961.6	0.6	0.965E-02
87	814	025	9	18.13	7585.0	2.0	0.334E-01
87	814	042	6	17.16	5857.1	0.3	0.477E-02
87	814	153	9	18.34	8560.2	1.5	0.185E-01
87	814	254	5	17.28	6757.3	0.4	0.582E-02
87	814	528	9	17.85	6604.5	1.3	0.170E-01
87	814	1229	9	18.27	14063.7	0.5	0.140E-01
87	814	19 9	9	18.67	13953.7	1.5	0.353E-01
87	815	035	9	18.38	8255.3	3.2	0.527E-01
87	815	128	10	18.13	11954.9	1.0	0.179E-01
87	815	129	6	17.18	7251.9	0.2	0.247E-02
87	815	233	8	17.77	7728.5	0.5	0.953E-02
87	815	248	9	17.90	12853.1	0.3	0.782E-02
87	815	12 3	5	17.39	7096.2	0.4	0.566E-02
87	815	1452	10	18.14	7053.7	1.5	0.237E-01
87	815	1534	9	17.99	10127.1	0.4	0.109E-01
87	815	19 8	6	17.31	6225.6	0.3	0.660E-02
87	816	029	7	17.18	4896.6	0.6	0.787E-02
87	816	4 2	8	17.30	9334.3	0.1	0.257E-02
87	816	457	6	16.48	3332.7	0.3	0.508E-02
87	816	13 0	8	17.61	9812.8	0.2	0.420E-02
87	817	0 4	7	17.05	4887.6	0.5	0.731E-02
87	817	120	5	17.33	6509.4	0.5	0.719E-02
87	817	616	7	17.42	7798.1	0.3	0.556E-02
87	817	819	5	17.27	6597.1	0.2	0.383E-02
87	817	941	7	17.34	5815.2	0.9	0.129E-01
87	817	946	9	18.54	10753.0	1.2	0.302E-01
87	817	1338	9	17.98	8717.9	1.4	0.289E-01
87	817	1358	9	18.09	12634.3	0.3	0.948E-02
87	817	1523	6	16.97	4893.4	0.4	0.591E-02
87	817	2219	6	17.89	8091.7	0.6	0.128E-01
87	818	0 4	9	19.15	16733.2	1.9	0.176E-01
87	818	344	7	18.17	9477.3	1.0	0.176E-01
87	818	1825	9	18.02	7639.7	1.3	0.267E-01
87	818	2332	7	17.48	6166.4	0.7	0.947E-02
87	819	623	8	17.03	5688.9	0.2	0.461E-02
87	819	2055	9	16.88	3320.6	0.8	0.237E-01
87	820	213	8	18.66	12348.6	1.3	0.335E-01
87	820	222	6	17.26	5136.5	0.7	0.758E-02
87	820	233	6	17.37	7200.1	0.4	0.531E-02
87	820	624	5	16.92	4346.6	0.5	0.771E-02
87	820	2018	8	17.09	6702.8	0.2	0.543E-02
87	820	2250	6	16.57	3557.5	0.4	0.657E-02
87	821	3 8	7	16.95	6144.4	0.2	0.818E-02
87	821	450	7	17.44	10336.2	0.1	0.296E-02
87	821	458	8	18.20	16573.6	0.2	0.918E-02
87	821	459	9	19.51	32163.9	1.0	0.228E-01
87	821	5 4	6	17.34	6440.8	0.3	0.541E-02
87	821	1151	5	17.13	4843.0	0.6	0.604E-02
87	821	1249	7	16.85	5295.9	0.3	0.325E-02
87	821	1937	5	17.77	8251.9	0.4	0.123E-01
87	822	935	7	17.49	11163.0	0.8	0.116E-01
87	822	1246	5	17.11	14253.0	0.3	0.407E-02
87	822	1432	7	17.67	7816.8	0.4	0.646E-02
87	822	1644	7	16.94	6766.0	0.1	0.211E-02
87	822	17 3	7	17.38	7403.2	0.4	0.588E-02
87	822	18 2	8	18.06	8888.7	1.2	0.178E-01
87	822	2057	5	16.28	3180.5	0.3	0.749E-02
87	822	22 5	8	17.35	6916.8	0.3	0.448E-02
87	822	2313	9	17.62	7394.4	0.5	0.837E-02
87	823	1046	6	17.44	7976.9	0.2	0.433E-02
87	823	1128	8	18.53	17719.2	0.3	0.130E-01
87	823	1351	8	17.74	7344.7	0.3	0.721E-02
87	823	1355	8	17.02	5747.7	0.3	0.552E-02
87	823	1356	8	17.39	7089.6	0.3	0.503E-02
87	823	1445	8	17.56	7755.2	0.9	0.142E-01

87	823	1526	5	17.39	12880.6	0.1	0.216E-02
87	823	1733	8	17.41	6652.4	0.3	0.483E-02
87	823	1750	8	17.62	5466.0	1.3	0.201E-01
87	823	2220	7	17.49	6293.3	0.3	0.628E-02
87	823	2258	9	18.14	7730.7	1.7	0.275E-01
87	824	724	7	17.46	6888.4	0.5	0.102E-01
87	824	1615	8	17.91	7154.0	1.7	0.272E-01
87	824	2017	7	16.98	5556.2	0.4	0.617E-02
87	825	032	8	17.61	7219.1	0.8	0.118E-01
87	825	044	8	17.55	6143.8	0.6	0.123E-01
87	825	322	7	17.48	6396.1	0.5	0.875E-02
87	825	420	5	16.74	5585.3	0.2	0.249E-02
87	825	449	6	16.97	13225.1	0.2	0.273E-02
87	825	651	7	17.37	6851.5	1.2	0.234E-01
87	825	653	8	17.53	5778.7	0.7	0.111E-01
87	825	831	6	16.83	6830.7	0.2	0.229E-02
87	825	942	7	17.65	5558.1	1.1	0.152E-01
87	825	1050	4	17.34	6809.2	0.4	0.993E-02
87	825	2333	6	17.54	7008.7	0.4	0.770E-02
87	826	1 7	7	17.33	7690.7	0.3	0.656E-02
87	826	758	8	18.01	13595.5	0.3	0.849E-02
87	826	1221	7	17.54	8543.5	0.3	0.661E-02
87	826	1855	7	17.21	5453.0	0.5	0.935E-02
87	826	2051	6	17.13	6128.1	0.2	0.589E-02
87	826	2124	6	17.05	6001.1	0.4	0.601E-02
87	826	2217	7	17.60	7240.1	0.5	0.915E-02
87	827	149	6	17.41	6531.1	0.7	0.881E-02
87	827	3 6	6	17.27	10374.9	0.1	0.202E-02
87	827	615	6	17.42	5802.0	0.8	0.109E-01
87	827	1412	7	17.61	7477.4	0.4	0.925E-02
87	827	1554	8	17.99	18885.3	0.2	0.453E-02
87	827	1910	7	17.76	11813.5	0.2	0.394E-02
87	827	2130	8	17.61	6328.7	0.8	0.157E-01
87	827	22 2	8	16.95	4698.5	0.6	0.146E-01
87	828	016	6	17.40	5601.8	0.5	0.734E-02
87	828	155	7	17.41	5832.4	1.5	0.118E-01
87	828	1017	8	18.01	7962.3	1.5	0.234E-01
87	828	1034	5	16.78	5939.0	0.2	0.415E-02
87	828	14 2	8	18.28	7967.9	1.8	0.314E-01
87	828	16 2	8	17.89	7099.6	1.1	0.164E-01
87	828	1743	8	18.27	10432.8	0.8	0.200E-01
87	828	2027	5	16.84	6703.7	0.2	0.474E-02
87	829	318	7	17.59	5925.9	1.1	0.149E-01
87	829	4 8	8	18.02	6418.7	2.2	0.205E-01
87	829	426	9	18.36	13878.0	2.4	0.356E-01
87	829	632	7	17.59	5334.1	1.6	0.235E-01
87	829	12 0	8	17.76	17698.2	0.1	0.221E-02
87	829	1248	5	17.05	7646.9	0.1	0.253E-02
87	829	2219	8	18.23	6729.7	2.3	0.398E-01
87	829	2316	5	16.61	6161.7	0.2	0.318E-02
87	830	346	5	17.40	7502.6	0.3	0.502E-02
87	830	1010	8	17.29	5548.1	0.6	0.851E-02
87	830	1025	6	17.51	5973.2	0.8	0.110E-01
87	830	1445	7	17.52	15895.7	0.1	0.216E-02
87	830	1722	8	17.26	5671.3	0.6	0.984E-02
87	830	1724	9	18.14	9338.5	1.0	0.220E-01
87	830	1732	9	18.19	8438.9	1.7	0.332E-01
87	830	1734	8	17.38	8000.1	0.2	0.568E-02
87	830	18 2	5	17.54	9684.7	0.2	0.349E-02
87	830	1942	9	17.91	6897.8	1.3	0.319E-01
87	830	2255	6	17.39	6660.9	0.4	0.603E-02
87	831	0 4	6	17.11	4587.8	0.5	0.615E-02
87	831	154	6	17.21	7371.5	0.4	0.518E-02
87	831	1052	6	17.32	5880.7	0.5	0.883E-02
87	831	1152	7	18.05	8661.2	0.8	0.165E-01
87	831	1233	8	17.91	5773.4	2.2	0.359E-01

87 831	1435	5	17.68	7180.4	0.6	0.100E-01
87 831	1522	8	17.58	6860.9	0.7	0.112E-01
87 831	1928	5	16.90	5819.3	0.2	0.307E-02
87 9 1	141	6	16.20	2984.0	0.3	0.445E-02
87 9 1	455	7	17.45	9655.1	0.2	0.366E-02
87 9 1	856	8	18.35	7665.7	1.9	0.331E-01
87 9 1	9 4	5	17.12	7738.0	0.2	0.395E-02
87 9 1	1328	8	17.83	6611.9	4.2	0.443E-01
87 9 1	1350	5	17.16	6722.5	0.1	0.292E-02
87 9 1	1357	8	17.63	5719.0	1.4	0.228E-01
87 9 1	2311	6	17.79	6883.5	0.7	0.110E-01
87 9 2	320	8	18.39	12134.0	0.6	0.183E-01
87 9 2	816	8	17.63	7244.6	0.6	0.960E-02
87 9 2	2213	5	18.62	12470.1	1.1	0.939E-02
87 9 2	2356	9	18.09	6804.8	2.2	0.345E-01
87 9 3	2133	8	18.48	12412.9	1.3	0.293E-01
87 9 3	2144	7	17.53	6780.6	0.8	0.822E-02
87 9 4	2011	5	17.60	9765.8	1.3	0.165E-01
87 9 5	038	7	17.63	5679.9	1.3	0.205E-01
87 9 5	054	6	17.30	5847.8	0.4	0.558E-02
87 9 5	556	6	17.03	4777.1	0.8	0.973E-02
87 9 5	1553	5	17.60	6296.3	0.8	0.111E-01
87 9 5	1929	5	16.74	4523.3	0.6	0.743E-02
87 9 5	2051	5	18.22	8278.0	1.1	0.171E-01
87 9 5	2311	6	16.81	3893.1	0.6	0.668E-02
87 9 6	242	7	17.63	6784.6	0.9	0.114E-01
87 9 6	5 9	7	17.91	6129.9	1.4	0.260E-01
87 9 6	813	6	17.53	5267.0	1.1	0.182E-01
87 9 6	14 3	6	16.97	6158.5	0.3	0.483E-02
87 9 7	430	6	17.73	10105.4	0.4	0.704E-02
87 9 7	726	6	17.19	5485.2	0.4	0.661E-02
87 9 7	19 7	7	16.80	5024.9	0.2	0.419E-02
87 9 7	2020	8	17.95	7572.4	1.4	0.222E-01
87 9 8	1621	7	17.69	6174.4	0.8	0.134E-01
87 912	051	9	18.30	7887.9	2.5	0.458E-01
87 912	347	8	17.65	7933.0	0.7	0.907E-02
87 912	1734	8	18.19	12647.8	0.4	0.109E-01
87 912	2043	9	17.51	7298.3	0.8	0.178E-01
87 912	2338	8	17.29	5716.6	0.8	0.118E-01
87 913	322	8	17.45	7049.8	0.3	0.680E-02
87 913	516	6	17.52	11313.3	0.1	0.247E-02
87 913	733	8	18.24	7993.0	2.1	0.355E-01
87 913	916	5	17.56	8147.0	0.3	0.544E-02
87 913	928	6	17.03	4873.2	0.5	0.758E-02
87 913	12 8	9	18.55	13939.7	1.5	0.375E-01
87 913	1250	8	18.42	9622.2	1.4	0.295E-01
87 913	1252	5	17.16	5819.4	0.3	0.457E-02
87 913	1326	6	16.98	5996.4	0.2	0.283E-02
87 913	16 0	9	17.35	5572.2	0.7	0.117E-01
87 913	17 0	6	16.89	5138.3	0.4	0.600E-02
87 913	2016	9	17.85	5809.6	1.1	0.193E-01
87 913	2041	7	17.44	7241.5	0.4	0.683E-02
87 914	333	5	16.74	5466.0	0.2	0.752E-02
87 914	624	6	17.11	5770.9	0.4	0.574E-02
87 914	910	7	17.44	5891.0	0.6	0.710E-02
87 914	1223	8	17.94	7978.5	1.1	0.217E-01
87 914	18 2	8	17.70	7803.1	0.7	0.148E-01
87 914	2216	6	17.94	7433.4	1.0	0.847E-02
87 915	251	6	17.41	7982.7	0.3	0.400E-02
87 915	256	7	17.29	7731.1	0.6	0.886E-02
87 915	348	8	18.14	9056.5	0.7	0.114E-01
87 915	718	7	17.34	4698.5	1.0	0.160E-01
87 915	1511	5	17.23	6921.0	0.5	0.835E-02
87 915	1553	8	18.30	12330.5	1.3	0.232E-01
87 915	1713	6	16.53	4986.1	0.2	0.353E-02
87 916	049	8	17.29	11375.9	0.6	0.860E-02

87 916	1 9	8	18.23	7347.7	1.8	0.345E-01
87 916	547	5	17.89	6425.5	1.5	0.203E-01
87 916	1658	9	18.72	12765.0	1.2	0.353E-01
87 916	19 7	6	14.08	426.8	0.8	0.113E+00
87 916	2037	6	16.91	9296.8	0.4	0.643E-02
87 916	2115	9	18.68	13189.8	1.2	0.336E-01
87 916	2133	9	18.25	9594.8	1.1	0.210E-01
87 917	013	6	16.70	4520.2	0.2	0.453E-02
87 917	020	7	17.15	5467.1	0.4	0.778E-02
87 917	5 3	7	17.16	4899.7	0.7	0.996E-02
87 917	929	7	17.20	6323.4	0.3	0.410E-02
87 917	1324	8	17.98	6334.0	2.3	0.354E-01
87 917	1325	7	17.31	5527.4	0.6	0.115E-01
87 917	1656	7	17.51	6222.6	0.4	0.636E-02
87 917	1731	7	17.23	5889.7	0.6	0.889E-02
87 917	1848	6	16.68	4344.5	0.3	0.464E-02
87 917	1854	8	17.45	9793.8	0.2	0.455E-02
87 917	19 3	9	18.18	7512.2	2.3	0.370E-01
87 917	2224	9	17.69	7102.9	0.8	0.138E-01
87 917	2227	6	20.08	27203.2	3.4	0.115E-01
87 918	811	8	18.00	6374.3	2.0	0.199E-01
87 918	1235	6	17.17	5676.5	0.4	0.568E-02
87 918	1819	9	18.24	12286.4	0.4	0.130E-01
87 918	2054	5	16.48	4893.9	0.1	0.237E-02
87 919	1 5	7	16.95	4859.3	0.4	0.691E-02
87 919	630	5	17.26	6883.1	0.2	0.328E-02
87 919	651	8	18.24	12735.9	0.4	0.119E-01
87 919	918	6	18.37	12902.5	0.7	0.177E-01
87 919	1028	7	17.47	6060.2	0.6	0.748E-02
87 919	1710	8	17.92	7030.2	1.0	0.178E-01
87 919	1711	7	17.80	9836.4	0.5	0.116E-01
87 920	427	6	16.96	4882.1	0.4	0.668E-02
87 920	1215	8	17.80	7479.5	0.6	0.112E-01
87 920	1822	7	17.36	6828.7	0.3	0.465E-02
87 920	1823	6	18.29	13179.0	0.7	0.181E-01
87 920	1920	7	17.55	6677.6	0.8	0.127E-01
87 921	2 2	7	17.91	6294.1	1.1	0.211E-01
87 921	518	9	18.33	15672.4	0.4	0.127E-01
87 921	15 1	6	16.92	4279.6	0.5	0.851E-02
87 921	21 5	8	18.48	8075.0	2.6	0.225E-01
87 921	23 8	9	17.74	7369.5	0.8	0.157E-01
87 922	254	7	17.62	6603.3	0.8	0.119E-01
87 922	613	7	17.52	11075.7	0.6	0.877E-02
87 922	617	8	17.50	5449.5	0.9	0.157E-01
87 922	7 1	6	17.22	5591.0	0.8	0.111E-01
87 922	827	7	17.17	5046.8	0.5	0.872E-02
87 922	1127	7	17.12	4976.2	0.4	0.819E-02
87 922	15 8	6	17.50	5330.5	1.2	0.116E-01
87 922	1711	9	17.60	5474.4	1.0	0.158E-01
87 922	2237	6	17.31	4930.0	0.8	0.108E-01
87 923	2 7	8	17.43	5565.4	0.7	0.958E-02
87 923	259	9	17.91	9216.5	0.8	0.146E-01
87 923	310	7	17.29	8676.1	0.7	0.816E-02
87 923	5 4	5	17.50	9657.4	0.3	0.584E-02
87 923	941	7	17.61	8175.4	0.4	0.772E-02
87 923	1551	5	17.62	7997.2	0.5	0.963E-02
87 923	2259	6	17.02	5283.8	0.4	0.445E-02
87 924	055	9	17.90	8291.3	0.6	0.107E-01
87 924	056	6	17.63	6933.6	0.7	0.116E-01
87 924	142	8	17.30	6356.8	0.5	0.933E-02
87 924	145	7	17.30	5632.8	1.6	0.146E-01
87 924	2 1	6	16.65	3799.5	0.3	0.612E-02
87 924	3 4	9	17.68	6688.8	0.5	0.954E-02
87 924	358	5	17.46	5449.4	0.7	0.986E-02
87 924	6 0	7	17.34	5919.4	0.4	0.614E-02
87 924	1212	5	17.35	4967.9	1.0	0.136E-01

87 924	1249	9	18.56	13234.0	1.0	0.295E-01
87 924	1251	6	17.16	5551.2	0.5	0.787E-02
87 924	13 1	7	17.32	7765.4	0.7	0.934E-02
87 924	1444	6	16.98	4227.8	0.5	0.843E-02
87 924	2127	6	17.40	6620.1	0.3	0.602E-02
87 925	351	5	16.88	4551.6	0.3	0.503E-02
87 925	8 3	5	16.83	4186.7	0.5	0.561E-02
87 925	1029	6	12.44	162.3	0.3	0.296E+00
87 925	1157	9	18.20	12268.1	0.9	0.143E-01
87 925	1311	8	17.33	5609.0	0.4	0.771E-02
87 925	1843	7	17.93	18408.2	0.1	0.226E-02
87 925	2041	9	17.69	5576.6	2.0	0.302E-01
87 925	2224	8	17.61	6289.8	0.7	0.108E-01
87 925	2226	6	17.03	6135.4	0.2	0.420E-02
87 926	038	9	18.25	9067.6	0.9	0.215E-01
87 926	135	5	17.01	5277.8	1.3	0.130E-01
87 926	239	6	18.29	14002.0	0.9	0.164E-01
87 926	1211	7	16.92	5046.0	0.3	0.362E-02
87 926	1320	7	17.76	8675.2	0.3	0.650E-02
87 926	1338	7	17.63	10281.6	0.5	0.855E-02
87 926	1650	9	17.93	12179.5	0.5	0.105E-01
87 926	1815	8	17.58	5590.3	1.1	0.149E-01
87 927	013	9	18.14	8837.9	1.0	0.201E-01
87 927	216	9	17.78	9944.7	0.2	0.568E-02
87 927	4 1	5	17.70	14972.1	0.1	0.363E-02
87 927	458	7	17.62	7596.1	0.5	0.749E-02
87 927	1237	5	17.13	6472.5	0.5	0.541E-02
87 927	1339	9	18.27	14308.4	0.3	0.108E-01
87 927	1343	9	17.61	8850.1	0.5	0.843E-02
87 927	1355	6	17.67	7230.7	0.8	0.123E-01
87 927	1445	6	17.09	5121.9	0.4	0.549E-02
87 928	336	9	17.99	8105.4	1.1	0.204E-01
87 928	4 3	8	17.20	7466.8	0.2	0.313E-02
87 928	644	5	17.31	6705.1	0.5	0.688E-02
87 928	11 6	6	17.19	6141.7	0.5	0.844E-02
87 928	1354	6	16.67	5339.5	0.2	0.288E-02
87 928	1923	6	17.33	6309.7	0.4	0.629E-02
87 929	029	9	17.69	10087.1	0.2	0.430E-02
87 929	517	9	17.65	5479.7	1.5	0.221E-01
87 929	7 7	5	16.74	3392.5	0.4	0.848E-02
87 929	7 7	7	17.50	6498.4	0.9	0.113E-01
87 929	821	6	17.13	4958.0	0.5	0.926E-02
87 929	11 7	7	17.41	7425.9	0.3	0.415E-02
87 929	1134	8	16.99	5019.8	0.7	0.978E-02
87 929	1228	7	17.07	5025.0	0.6	0.807E-02
87 929	1242	5	16.18	2744.7	0.6	0.761E-02
87 929	1437	9	18.38	11381.1	1.6	0.279E-01
87 929	1751	8	17.75	10264.9	0.3	0.650E-02
87 929	1812	6	17.63	6707.8	0.5	0.866E-02
87 929	1813	8	17.89	7207.9	1.1	0.129E-01
87 929	19 2	6	18.01	12968.5	0.4	0.587E-02
87 929	20 7	8	17.67	5273.5	0.8	0.139E-01
87 929	2028	7	17.62	6246.9	0.5	0.736E-02
87 929	2039	6	17.36	6265.4	0.4	0.732E-02
87 929	2238	5	16.74	3861.8	0.4	0.667E-02
87 930	159	9	18.35	9598.0	3.1	0.500E-01
87 930	159	9	17.99	7617.8	1.2	0.214E-01
87 930	225	9	17.59	6171.0	1.2	0.127E-01
87 930	325	9	17.83	11755.1	0.3	0.743E-02
87 930	640	6	17.02	5665.1	0.5	0.529E-02
87 930	8 0	5	16.54	4225.8	0.3	0.504E-02
87 930	1024	9	18.19	7584.4	1.5	0.293E-01
87 930	1026	7	17.27	7849.0	0.1	0.248E-02
87 930	1047	8	17.59	10550.0	0.1	0.283E-02
8710 1	430	9	17.88	7140.8	0.6	0.116E-01
8710 1	732	9	18.00	8266.8	1.1	0.202E-01

8710 1	1033	8	17.84	9809.2	0.4	0.799E-02
8710 1	1141	5	16.75	4449.5	0.2	0.432E-02
8710 1	12 5	6	17.59	6996.9	0.4	0.730E-02
8710 1	1817	9	18.59	11766.8	2.2	0.394E-01
8710 1	2043	8	17.40	6892.8	0.4	0.623E-02
8710 1	23 7	8	18.04	8673.6	0.8	0.172E-01
8710 2	050	7	17.22	4983.6	0.5	0.888E-02
8710 2	130	9	17.49	7851.8	0.5	0.725E-02
8710 2	433	6	17.19	6908.7	1.1	0.105E-01
8710 2	714	7	17.38	5176.6	1.0	0.153E-01
8710 3	928	7	17.90	9370.3	0.5	0.924E-02
8710 3	10 6	6	17.61	7333.6	0.3	0.580E-02
8710 3	1933	5	17.63	7697.0	0.4	0.100E-01
8710 3	1935	6	17.26	5011.7	0.7	0.117E-01
8710 4	1844	7	17.64	7055.2	1.0	0.179E-01
8710 5	2111	6	17.05	4470.7	0.6	0.101E-01
8710 6	137	7	17.69	6263.9	1.1	0.134E-01
8710 6	754	5	17.09	6813.8	0.2	0.387E-02
8710 6	935	7	17.63	6947.7	1.2	0.213E-01
8710 6	23 6	6	16.91	5114.7	0.3	0.613E-02
8710 7	1125	7	17.21	4320.0	1.2	0.150E-01
8710 8	052	6	17.67	6021.3	1.3	0.178E-01
8710 8	7 6	7	17.49	5454.9	0.6	0.950E-02
8710 8	1612	5	17.06	6501.4	0.3	0.568E-02
8710 9	238	7	17.98	6744.0	1.8	0.219E-01
8710 9	642	5	17.12	5865.8	0.5	0.569E-02
8710 9	1642	5	16.85	4645.4	0.3	0.416E-02
8710 9	1644	7	17.29	5078.9	0.7	0.115E-01
8710 9	1911	6	16.96	5452.2	0.7	0.895E-02
871010	955	6	17.18	5033.6	0.4	0.792E-02
871010	1015	7	17.86	5859.0	2.0	0.329E-01
871010	19 7	7	17.10	4433.1	1.2	0.146E-01
871010	2355	7	17.96	6549.7	2.1	0.385E-01
871010	2355	7	17.63	4548.6	4.0	0.428E-01
871011	148	7	17.72	6485.6	1.2	0.219E-01
871011	153	7	17.32	5565.2	0.6	0.102E-01
871011	710	6	17.23	5843.1	0.4	0.724E-02
871012	20 6	6	16.92	4147.8	0.6	0.696E-02
871012	2340	7	18.26	8657.8	2.1	0.346E-01
871013	915	5	17.61	5822.9	1.3	0.142E-01
871013	1035	5	17.57	5874.1	0.5	0.856E-02
871013	1843	6	16.75	5159.0	0.2	0.508E-02
871014	628	6	17.27	5003.4	0.8	0.110E-01
871014	1329	6	17.91	6129.5	1.8	0.259E-01
871015	10 4	5	17.47	5562.6	0.6	0.841E-02
871016	11 9	7	17.84	6391.4	1.4	0.213E-01
871016	1718	7	18.39	10553.0	1.5	0.343E-01
871016	1934	5	18.29	7863.5	1.7	0.163E-01
871017	2 0	6	16.76	5504.9	0.2	0.497E-02
871017	534	9	17.71	10765.4	0.2	0.377E-02
871017	814	8	17.92	5663.9	2.3	0.242E-01
871017	844	10	17.98	7179.6	1.5	0.208E-01
871017	1240	10	18.14	7909.7	0.9	0.201E-01
871017	1319	9	17.85	7494.6	0.7	0.129E-01
871017	1335	8	17.70	7008.2	0.6	0.104E-01
871017	2322	8	17.77	7288.5	0.6	0.112E-01
871018	013	8	17.51	5700.2	1.4	0.252E-01
871018	250	9	17.47	5809.4	0.7	0.109E-01
871018	435	8	17.09	6643.3	0.2	0.557E-02
871018	546	5	16.74	3508.3	0.7	0.117E-01
871018	7 5	5	16.72	3507.7	1.0	0.124E-01
871018	1111	10	18.36	15444.7	0.3	0.885E-02
871018	1725	6	17.62	8385.4	0.3	0.504E-02
871019	212	6	17.88	8985.6	0.6	0.750E-02
871019	738	5	17.38	6327.2	0.8	0.138E-01
871019	9 6	6	17.18	7880.0	0.1	0.389E-02

871019	1048	6	17.37	5081.0	0.7	0.114E-01
871019	1053	5	16.72	3378.0	0.6	0.105E-01
871019	12 8	9	18.05	7552.3	1.9	0.284E-01
871019	15 7	5	19.24	22608.4	1.0	0.105E-01
871019	1818	9	17.86	6706.3	1.2	0.200E-01
871019	2235	7	18.29	26000.0	0.0	0.241E-02
871020	655	10	18.00	5588.1	2.7	0.285E-01
871020	1054	7	18.27	10537.3	1.0	0.997E-02
871020	1611	5	16.69	4023.7	0.3	0.105E-01
871020	17 3	7	17.40	4496.2	1.4	0.224E-01
871020	1938	9	18.02	5850.5	2.6	0.333E-01
871020	2056	5	18.05	11780.5	0.4	0.706E-02
871020	23 8	6	17.18	3968.8	1.0	0.190E-01
871021	333	7	18.24	8338.5	1.4	0.137E-01
871021	522	5	17.27	4783.7	0.6	0.122E-01
871021	1454	5	16.76	5790.6	0.2	0.714E-02
871021	17 0	7	17.96	6649.7	1.3	0.181E-01
871021	2157	6	18.66	37369.6	0.1	0.145E-02
871022	731	6	16.87	4910.9	0.3	0.567E-02
871022	1235	9	17.55	4641.1	2.0	0.218E-01
871022	1326	10	18.21	5548.3	4.2	0.561E-01
871022	19 2	6	17.50	8214.4	0.3	0.562E-02
871022	2252	8	18.54	7395.6	3.9	0.546E-01
871023	135	5	18.09	5309.8	3.8	0.194E-01
871023	842	9	18.05	7366.5	1.2	0.224E-01
871023	920	6	16.95	4360.1	0.7	0.122E-01
871023	1020	5	17.38	5457.4	0.8	0.125E-01
871023	1325	6	17.42	3771.4	3.2	0.355E-01
871024	239	8	18.61	40055.0	0.0	0.346E-02
871024	543	8	17.61	4204.4	2.5	0.367E-01
871024	621	6	17.22	6235.8	0.3	0.772E-02
871024	631	6	17.75	5779.5	1.1	0.163E-01
871024	1112	7	16.97	3753.7	1.6	0.157E-01
871024	1148	9	18.82	7836.7	6.6	0.787E-01
871024	1150	8	18.09	8232.7	1.7	0.257E-01
871024	1420	10	18.61	11230.4	1.8	0.454E-01
871024	2014	8	18.64	7596.7	13.8	0.856E-01
871024	2039	5	18.01	16811.8	0.2	0.671E-02
871024	21 9	7	19.04	18135.0	1.2	0.298E-01
871025	248	5	16.96	5011.7	0.4	0.669E-02
871025	358	5	17.69	7101.0	0.5	0.110E-01
871025	612	8	18.44	8624.3	3.5	0.856E-01
871025	7 7	5	16.86	3741.2	0.6	0.929E-02
871025	725	8	17.63	5621.7	1.2	0.187E-01
871025	952	5	16.87	4483.9	0.3	0.573E-02
871025	1013	6	16.52	4030.8	0.2	0.484E-02
871025	1028	8	17.61	4382.6	2.3	0.352E-01
871025	1046	10	18.55	11173.0	1.4	0.349E-01
871025	12 9	7	17.49	4194.7	2.7	0.295E-01
871025	1238	7	18.57	14551.5	3.6	0.532E-01
871025	1453	6	17.31	5030.3	1.1	0.125E-01
871025	1517	7	17.31	5552.4	0.5	0.951E-02
871025	16 0	9	17.84	7502.2	1.9	0.239E-01
871025	1728	7	17.96	7177.7	1.4	0.249E-01
871025	1813	5	19.77	48317.7	0.4	0.200E-01
871025	1816	10	18.66	14518.0	3.6	0.408E-01
871025	21 5	5	16.83	2977.6	1.6	0.162E-01
871025	2314	9	17.52	6209.9	0.7	0.134E-01
871026	226	6	17.04	4384.1	0.5	0.943E-02
871026	458	7	17.81	5615.9	1.7	0.247E-01
871026	537	6	17.32	5319.5	0.8	0.138E-01
871026	654	8	17.70	4737.5	2.6	0.397E-01
871026	1421	6	17.09	4513.5	0.7	0.112E-01
871026	1437	5	17.39	4237.0	1.5	0.204E-01
871027	9 5	7	18.03	7041.5	1.3	0.245E-01
871027	11 5	5	16.71	3724.3	0.5	0.723E-02

871028	113	6	17.60	6628.3	0.7	0.121E-01
871028	346	8	17.39	5127.7	0.6	0.144E-01
871028	350	8	18.11	7342.3	1.2	0.238E-01
871028	9 6	9	18.40	8061.8	3.1	0.497E-01
871028	1055	7	17.24	5598.5	1.6	0.226E-01
871028	1219	5	17.38	4670.4	0.5	0.108E-01
871028	1227	9	18.02	5605.9	3.4	0.404E-01
871028	1330	9	18.09	7883.1	1.3	0.266E-01
871030	2315	6	17.23	5715.0	0.5	0.985E-02
871031	149	10	19.24	12574.2	4.5	0.590E-01
871031	229	9	17.59	6796.5	1.6	0.183E-01
871031	451	7	17.34	5295.2	0.5	0.107E-01
871031	9 1	9	18.10	13611.6	0.3	0.877E-02
871031	917	9	17.74	5397.3	1.2	0.218E-01
871031	1158	7	16.96	4254.7	0.6	0.988E-02
8711 5	4 2	5	17.36	8625.7	0.3	0.533E-02
8711 5	6 3	7	17.65	6650.0	0.8	0.140E-01
8711 5	623	8	18.02	6515.6	2.0	0.376E-01
8711 5	624	7	16.95	5471.8	0.3	0.753E-02
8711 5	916	7	17.16	4651.7	0.9	0.136E-01
8711 5	946	5	16.59	4388.9	0.3	0.476E-02
8711 5	2048	8	17.95	6252.7	2.0	0.399E-01
8711 5	2139	7	19.26	18199.5	3.0	0.556E-01
8711 5	2226	8	17.72	6592.8	1.9	0.277E-01
8711 5	2227	7	16.98	4832.5	0.4	0.666E-02
8711 6	216	7	17.35	4559.4	1.8	0.261E-01
8711 6	4 8	6	17.72	6680.0	1.1	0.144E-01
8711 6	6 2	5	16.95	5940.8	0.4	0.700E-02
8711 6	614	6	17.43	6148.3	0.5	0.865E-02
8711 6	9 2	7	17.17	5668.3	0.4	0.694E-02
8711 6	11 3	6	17.34	4276.2	6.0	0.560E-01
8711 6	1138	6	17.53	5367.6	1.2	0.163E-01
8711 6	1231	6	17.18	4077.1	1.0	0.139E-01
8711 6	1351	8	18.85	18493.4	0.8	0.265E-01
8711 6	1357	5	16.04	2076.2	2.1	0.106E+00
8711 6	1519	7	16.83	4121.9	0.4	0.106E-01
8711 6	1547	8	17.74	5272.1	4.2	0.542E-01
8711 6	1753	7	17.01	3660.9	1.2	0.165E-01
8711 7	1 1	8	18.24	7707.4	2.1	0.440E-01
8711 7	415	8	18.17	13104.5	0.3	0.113E-01
8711 7	427	7	17.04	3801.5	0.8	0.130E-01
8711 7	1320	7	16.92	4025.8	0.6	0.104E-01
8711 7	1356	8	17.69	7858.2	0.6	0.112E-01
8711 7	1443	8	17.91	5945.4	1.9	0.328E-01
8711 7	1517	5	17.10	5042.4	0.5	0.885E-02
8711 7	1616	8	17.74	10089.8	0.3	0.959E-02
8711 7	1719	7	17.40	10137.1	0.8	0.152E-01
8711 7	1732	5	17.44	7633.8	0.3	0.789E-02
8711 7	1920	7	16.98	4608.8	0.5	0.808E-02
8711 7	21 4	5	17.92	10493.2	0.3	0.585E-02
8711 7	22 8	5	16.92	4875.8	0.4	0.679E-02
8711 7	2315	1	17.60	6309.1	0.7	0.404E-01
8711 7	2317	7	18.78	14103.2	1.0	0.355E-01
8711 8	010	5	16.63	3455.3	0.5	0.678E-02
8711 8	011	5	16.73	4338.8	1.1	0.118E-01
8711 8	255	7	17.12	4561.1	1.0	0.121E-01
8711 8	3 0	8	18.42	11676.5	1.6	0.334E-01
8711 8	3 1	1	18.41	10931.1	0.9	0.339E-01
8711 8	341	6	17.55	5053.6	1.3	0.188E-01
8711 8	430	6	16.85	5036.5	0.3	0.651E-02
8711 8	439	5	16.78	4017.4	0.4	0.696E-02
8711 8	749	8	18.50	12047.3	0.3	0.199E-01
8711 8	1045	7	17.46	4981.0	1.6	0.221E-01
8711 8	11 3	5	17.35	5190.6	0.8	0.134E-01
8711 8	1452	7	17.32	5540.6	0.6	0.822E-02
8711 8	1514	6	16.87	5162.4	0.3	0.661E-02

8711 8	1544	6	17.11	4725.6	0.5	0.104E-01
8711 8	1854	6	17.12	6220.3	0.4	0.728E-02
8711 8	2036	7	17.33	5377.2	0.5	0.115E-01
8711 9	325	5	16.25	4422.3	0.2	0.492E-02
8711 9	840	8	17.51	4636.5	1.6	0.250E-01
8711 9	1519	6	16.79	3789.9	0.5	0.883E-02
8711 9	21 2	5	16.53	3536.1	0.5	0.776E-02
8711 9	2115	7	17.30	3964.0	1.9	0.207E-01
8711 9	2130	7	17.47	4519.5	1.5	0.165E-01
8711 9	22 8	6	18.68	8833.7	3.5	0.185E-01
8711 9	23 9	7	17.64	5167.2	1.5	0.237E-01
871110	018	5	16.58	4357.5	0.2	0.367E-02
871110	826	7	17.78	6881.7	0.8	0.163E-01

APPENDIX B
EVENT LISTING WITH LOCATIONS

SOUTH GEYSERS EARTHQUAKES 6/10-11/10/87

DATE	TIME	LATITUDE	LONGITUDE	ELEVATION	LOGMOM	MAG	QL
87 610	1830 12.76	397247.47	1790474.38	-13456.40	18.05	1.66	b
87 610	1836 12.76	396926.94	1790348.25	-13261.85	18.14	1.72	b
87 610	2134 31.49	404363.88	1787038.63	-2869.00	17.26	1.05	b
87 610	2140 20.72	409095.44	1776537.25	-13477.29	18.86	2.27	a
87 610	2215 54.65	405016.41	1785277.88	-2695.06	17.26	1.04	b
87 611	129 32.74	409866.09	1778475.38	-13479.73	17.42	1.17	a
87 611	142 59.77	405848.44	1777743.13	-13382.77	18.19	1.76	a
87 611	2 5 56.94	395388.91	1801519.88	-14224.56	17.65	1.35	a
87 611	222 7.45	406950.13	1776450.88	-34624.94	19.17	2.52	c
87 611	336 37.51	406208.66	1785851.75	-18566.55	17.64	1.34	a
87 611	834 40.96	407374.63	1782168.25	-11837.42	17.64	1.34	b
87 611	1354 37.88	409105.59	1780280.63	-13087.83	18.10	1.69	a
87 611	1635 28.16	405356.31	1781912.38	-8410.09	17.47	1.21	b
87 611	1857 10.33	406968.16	1780990.25	-6254.74	17.59	1.30	c
87 611	2211 35.85	395515.88	1796532.38	-13400.28	18.58	2.07	a
87 612	027 17.67	407787.69	1776616.25	-13477.80	17.89	1.53	a
87 612	935 41.04	405784.78	1782577.38	-12647.45	17.79	1.45	a
87 612	1011 7.39	399119.50	1792695.13	-4908.64	17.21	1.00	c
87 612	1054 25.93	406526.56	1781126.63	-13447.50	17.70	1.39	a
87 612	1522 31.53	407384.16	1778361.88	-14233.90	17.99	1.61	b
87 612	1635 28.40	404706.72	1783347.50	-5492.74	17.24	1.03	b
87 612	1726 29.34	405908.13	1782861.88	-6179.16	17.05	0.88	b
87 612	1749 5.79	405230.66	1785757.88	-1156.69	16.89	0.76	b
87 612	1753 53.62	404870.41	1785586.63	-2934.81	17.08	0.91	b
87 612	1834 32.61	404999.00	1786260.00	-2826.68	17.21	1.00	a
87 612	1938 20.63	402232.63	1786080.00	-2598.92	16.93	0.79	b
87 612	1940 30.65	404024.94	1787769.25	-1576.74	17.00	0.85	a
87 612	2114 11.43	404964.25	1785431.50	-5309.78	17.91	1.54	b
87 612	22 8 56.51	404132.88	1786991.75	-2932.27	16.94	0.80	c
87 612	2312 32.39	403662.44	1786635.13	-4312.94	17.12	0.94	a
87 613	528 58.77	406269.34	1785206.38	-1884.13	17.62	1.32	b
87 613	747 44.39	402529.88	1788724.63	-23203.87	18.44	1.95	b
87 613	826 9.88	407703.72	1776181.75	-13453.03	18.02	1.63	a
87 613	1058 20.74	410544.22	1781410.50	-13182.46	17.63	1.33	a
87 613	1312 8.73	403965.91	1786375.25	-164.13	17.01	0.86	b
87 613	1320 44.71	409871.97	1779405.50	-31390.56	18.41	1.93	b
87 613	1511 44.30	405647.31	1783539.00	-7268.01	16.98	0.83	b
87 613	1923 52.02	409355.59	1785647.50	-13422.10	17.85	1.50	a
87 613	1946 44.93	410136.09	1783544.00	-13216.72	18.18	1.75	a
87 613	2052 50.23	403889.78	1791147.25	-8845.98	17.47	1.21	b
87 613	2054 7.10	403567.63	1790662.00	-9767.79	17.65	1.35	b
87 613	22 9 7.69	409860.84	1776845.75	-15177.78	18.01	1.62	c
87 613	2317 2.61	395783.56	1786577.50	-11525.89	17.78	1.45	b
87 614	026 43.54	404444.88	1780253.38	-16311.55	17.53	1.25	c
87 614	029 58.80	407961.91	1777056.88	-11934.71	18.05	1.65	a
87 614	119 38.73	407160.41	1776894.88	-13135.94	17.84	1.49	a
87 614	217 48.93	397892.81	1794395.75	-13214.30	18.24	1.80	a
87 614	314 37.37	392785.59	1781437.00	-33348.18	18.29	1.84	c
87 614	4 6 34.86	409421.53	1780841.25	-12957.11	17.68	1.37	a
87 614	439 38.29	405898.59	1784894.38	-7424.45	17.34	1.11	b
87 614	8 3 32.81	407809.00	1778020.88	-13257.65	18.14	1.73	a
87 614	1042 20.19	405840.88	1785016.75	-8773.78	17.49	1.22	c
87 614	1052 54.68	406482.59	1783972.13	-16473.13	18.95	2.35	a
87 614	1353 19.53	412926.44	1778791.75	-15040.58	18.01	1.62	c
87 614	1740 15.85	407447.47	1778230.50	-12955.75	18.01	1.62	a
87 614	1835 28.72	409175.47	1776553.63	-13015.69	17.73	1.41	a
87 614	1958 25.59	397883.28	1777011.00	-499.55	16.75	0.65	b
87 614	2027 46.11	403725.09	1786632.88	-8254.03	17.26	1.04	b
87 614	2053 1.92	410443.81	1782311.63	-13427.08	17.89	1.53	a
87 615	3 2 30.92	403945.22	1784006.38	-10869.82	18.11	1.70	c
87 615	1656 17.51	410276.19	1784799.50	-3816.48	17.49	1.22	b
87 615	2321 22.54	407792.94	1787858.75	-3554.39	17.12	0.94	b
87 615	2331 39.71	408736.84	1776260.88	-13134.10	18.39	1.91	a

87	616	323	49.23	406449.78	1781003.00	-22179.73	18.65	2.12	d
87	616	8	8 14.01	404028.22	1791228.50	-12859.20	17.93	1.56	a
87	616	9	9 40.53	395477.16	1784605.00	-11621.55	17.71	1.39	a
87	616	1734	19.01	409164.66	1782643.50	-9593.60	18.01	1.62	c
87	616	1912	22.98	404996.38	1791721.75	-13342.32	18.13	1.72	a
87	616	2332	35.41	394500.47	1782071.13	-10497.93	17.43	1.18	a
87	617	212	56.81	405257.56	1781951.38	-7943.32	18.30	1.85	c
87	617	7	2 19.80	406547.88	1779642.38	-16975.50	18.14	1.72	a
87	617	734	34.82	410220.72	1780204.63	-13314.59	17.53	1.25	a
87	617	9	6 44.75	405907.16	1782084.00	-13329.30	18.28	1.83	a
87	617	10	7 8.91	408738.78	1786863.38	-11375.67	17.89	1.53	c
87	617	1635	52.47	405919.94	1784187.38	-5630.50	17.79	1.46	a
87	617	1825	21.86	408545.88	1781387.75	-13479.27	17.52	1.25	a
87	617	2123	18.66	396279.63	1786360.75	-10840.32	17.55	1.27	c
87	618	045	47.90	411562.59	1786211.00	-10877.58	17.28	1.06	c
87	618	1359	1.19	403827.44	1786741.00	-7306.64	17.49	1.22	a
87	618	17	5 43.05	408763.06	1785059.38	-10925.21	17.86	1.50	c
87	618	1759	27.02	402850.09	1785218.75	-8770.90	17.97	1.59	c
87	618	1940	58.12	407274.25	1786826.75	1584.51	16.52	0.48	a
87	619	1	4 24.85	400591.59	1776125.50	-6832.31	17.63	1.33	b
87	619	341	17.10	396806.84	1792617.38	8689.16	16.75	0.65	a
87	619	538	51.81	403440.97	1777700.38	-11256.25	18.20	1.77	c
87	619	539	55.97	404374.34	1779608.38	-10497.37	17.57	1.28	c
87	619	651	25.04	407107.25	1787760.75	2038.73	16.69	0.61	a
87	619	1158	52.13	403373.38	1786911.63	-7118.37	17.57	1.28	b
87	619	1738	13.67	405671.25	1776295.13	-13315.33	17.58	1.29	a
87	619	1919	11.82	407562.00	1798546.63	-19786.62	18.73	2.18	c
87	620	041	14.69	407575.44	1776395.38	-13436.84	17.78	1.44	a
87	620	134	33.61	397665.44	1799977.38	-14526.19	18.00	1.61	a
87	620	333	30.84	407624.31	1779190.63	-13111.76	17.71	1.39	a
87	620	350	23.24	391879.09	1782890.13	45329.60	17.22	1.01	d
87	620	845	40.14	404984.91	1783613.25	-8844.07	17.21	1.01	a
87	620	1423	56.42	411857.19	1787104.88	24146.03	15.34	-0.43	a
87	620	1424	20.40	399855.72	1781233.38	-34753.32	18.91	2.32	d
87	620	1522	17.98	403482.00	1781184.50	-9620.57	18.47	1.98	b
87	620	22	0 53.84	408471.41	1781925.00	-12947.30	17.54	1.26	a
87	621	046	43.30	405160.09	1790479.25	583.60	16.79	0.68	c
87	621	058	18.61	406925.84	1784755.88	-10698.29	17.87	1.52	c
87	621	246	27.73	411425.44	1780183.50	-12899.88	18.13	1.71	a
87	621	1727	2.38	406402.88	1787112.13	-5523.89	17.38	1.14	b
87	621	2131	24.85	402119.78	1790360.88	-13467.45	17.70	1.38	a
87	621	2312	15.17	399374.09	1793694.75	33.56	16.22	0.25	b
87	622	430	58.84	409501.56	1781236.38	-12882.82	18.18	1.75	a
87	622	941	9.76	409873.31	1778850.38	-13433.97	17.80	1.46	b
87	622	12	1 58.92	408845.09	1786238.38	-11171.88	17.75	1.42	c
87	622	1723	6.89	404337.28	1790449.00	-11880.35	17.56	1.27	c
87	622	2013	31.49	405750.66	1787061.25	-4512.79	16.83	0.72	b
87	622	2019	15.52	405504.25	1787344.13	-3475.39	16.79	0.68	b
87	622	2356	20.81	411588.81	1778564.13	-11085.48	17.01	0.85	b
87	623	726	9.90	410291.25	1780954.75	-12860.77	17.13	0.95	b
87	623	1418	39.24	402085.34	1778952.50	-20735.84	18.70	2.16	d
87	624	056	12.77	413011.72	1779168.38	-11761.51	17.10	0.92	b
87	624	128	11.93	397422.00	1794321.25	-13377.44	17.33	1.10	a
87	624	211	20.94	398902.63	1790553.25	-10457.83	17.69	1.37	b
87	624	332	2.85	408506.19	1781696.50	-12122.73	17.59	1.30	a
87	624	1622	15.43	405569.88	1787208.63	-4699.42	17.07	0.90	b
87	624	1627	9.84	406489.47	1790203.13	-13439.34	17.45	1.19	a
87	624	20	1 57.97	405010.19	1790964.38	-13066.29	17.57	1.29	b
87	624	2018	45.71	408156.47	1776392.38	-13042.90	17.61	1.31	b
87	624	2213	57.89	407930.75	1781146.63	-12598.17	18.02	1.63	b
87	624	2242	41.84	407709.28	1780998.63	-13279.76	18.29	1.84	b
87	624	2350	43.06	402729.69	1780300.75	-8077.03	17.79	1.45	b
87	625	110	16.68	408848.06	1777769.50	-13480.19	17.17	0.98	a
87	625	315	23.84	409069.50	1778133.38	-12088.44	18.17	1.75	a
87	625	6	4 40.83	405108.59	1791155.38	-13394.75	17.76	1.43	a
87	625	1047	15.14	407502.59	1780863.25	-12815.72	18.23	1.79	a

87 625	1053 24.14	409104.63	1787895.63	-12139.09	17.39	1.15	a
87 625	1114 36.75	411347.38	1777973.50	-12699.97	17.49	1.22	b
87 625	1230 2.03	409918.25	1783714.00	-12977.79	17.65	1.35	a
87 625	1248 21.89	408850.69	1781638.25	-12691.93	17.52	1.24	a
87 625	15 6 27.84	407614.81	1780777.13	-13344.94	17.45	1.19	a
87 625	1543 0.66	410346.06	1780105.00	-16148.37	17.37	1.13	b
87 625	1713 14.86	405642.03	1792356.50	-12852.65	17.99	1.61	c
87 625	1733 50.72	407089.22	1785010.75	-2819.18	16.78	0.67	a
87 625	2218 9.51	407741.44	1784138.50	-5184.13	17.12	0.94	a
87 625	2233 23.61	412401.16	1777200.63	-13415.51	18.63	2.10	a
87 625	2243 31.64	411940.84	1777644.75	-13232.07	17.81	1.47	b
87 626	114 51.93	413183.97	1785866.13	-13342.90	18.09	1.68	a
87 626	410 29.78	411398.53	1778202.38	-12588.87	17.70	1.39	a
87 626	1044 24.77	408518.97	1776028.00	-13080.65	18.33	1.87	a
87 626	1321 24.62	411008.13	1776614.50	-14294.92	17.79	1.45	a
87 626	1448 12.45	398671.03	1789459.13	-5099.00	17.21	1.01	b
87 626	1737 6.01	412190.84	1783072.75	-12983.23	18.38	1.91	b
87 626	19 5 45.69	406940.28	1785529.13	-2956.07	17.05	0.88	b
87 626	1924 21.35	405514.78	1785067.75	-6858.97	17.18	0.98	c
87 626	1944 3.10	406453.75	1793378.75	-940.22	16.53	0.49	b
87 627	014 27.93	410570.47	1781743.38	-13433.28	17.57	1.29	a
87 627	040 11.71	407681.72	1777041.00	-13410.33	17.75	1.42	a
87 627	519 7.78	405979.66	1777723.88	-11471.08	18.19	1.76	c
87 627	537 5.89	409087.53	1781334.00	-12518.39	18.02	1.63	a
87 627	1735 36.94	404704.72	1791287.38	-13474.30	17.59	1.30	a
87 627	20 7 14.87	403252.34	1785178.75	-15854.68	17.71	1.39	a
87 627	2058 59.17	405931.09	1781501.00	-9246.49	17.44	1.18	c
87 627	22 4 19.36	404693.25	1792986.50	-24285.57	17.69	1.38	b
87 628	035 56.08	407537.38	1784793.63	-9556.16	17.09	0.92	c
87 628	222 55.96	404461.31	1790908.38	-13327.45	17.75	1.42	a
87 628	837 10.91	402339.59	1790379.13	-11321.90	17.74	1.41	b
87 628	845 56.33	405692.25	1788313.00	-22021.39	18.08	1.68	c
87 628	931 54.01	401243.47	1778041.63	-22356.24	17.69	1.38	c
87 628	1051 31.40	411270.59	1801301.25	-20463.84	17.21	1.01	a
87 628	1123 46.56	404500.00	1787638.38	-1997.91	17.30	1.08	c
87 628	1728 12.22	405043.00	1792647.25	-9272.58	17.15	0.96	b
87 628	1744 46.12	403293.97	1789887.63	-10566.27	17.16	0.97	c
87 628	1954 20.98	402489.53	1788484.13	-12259.91	17.41	1.16	c
87 628	2029 18.52	406201.44	1792612.75	-7900.34	17.06	0.89	b
87 628	2142 13.96	405001.31	1780775.63	-11256.83	17.47	1.20	b
87 628	2325 23.55	413897.88	1800212.50	-19500.29	17.63	1.33	c
87 629	140 22.79	395372.50	1802386.38	-13983.67	17.53	1.25	d
87 629	238 37.75	396408.88	1790141.38	-12093.29	17.58	1.29	a
87 629	315 0.90	406890.06	1778324.75	-12540.37	17.42	1.17	b
87 629	348 44.97	406319.88	1781823.25	-11229.28	17.64	1.34	b
87 629	2250 55.03	397197.94	1792186.88	-12236.82	16.93	0.79	d
87 630	212 7.05	407167.31	1783791.25	-26270.13	17.34	1.11	c
87 630	15 7 38.11	405993.44	1781471.88	-13416.07	17.31	1.08	a
87 630	1827 53.94	403005.28	1783663.13	-10031.56	18.01	1.62	b
87 7 1	614 56.88	406364.47	1779545.63	-12885.94	17.36	1.12	a
87 7 1	19 7 31.39	406222.44	1783524.50	-20096.87	17.92	1.55	c
87 7 1	2154 48.04	397490.91	1797461.75	-12550.24	17.88	1.52	a
87 7 1	2241 52.96	404753.63	1789332.25	-16273.89	18.02	1.63	a
87 7 2	254 15.70	404166.03	1776062.88	-12822.75	17.93	1.56	b
87 7 2	420 59.59	410841.78	1776441.75	-13358.51	18.31	1.85	a
87 7 2	520 12.72	408940.25	1776488.38	-13159.33	17.81	1.47	a
87 7 2	2140 19.29	407406.81	1788099.25	2864.70	16.32	0.32	b
87 7 3	19 4 49.17	406089.56	1784531.50	-8560.55	17.53	1.25	a
87 7 3	2156 7.08	408394.66	1785337.88	-13236.12	17.72	1.40	a
87 7 4	019 52.83	407578.72	1784119.50	-13016.11	18.08	1.68	a
87 7 4	035 7.81	403413.41	1783052.50	-12281.19	17.99	1.61	c
87 7 4	1636 47.21	404411.75	1784063.63	-8073.60	17.31	1.08	c
87 7 4	1840 33.28	404334.31	1784949.88	-6911.83	17.49	1.22	c
87 7 4	2238 42.00	391735.06	1785249.25	-24361.57	18.02	1.63	a
87 7 4	2354 57.08	398776.66	1795443.63	-13266.60	18.11	1.70	a
87 7 5	324 9.38	399248.44	1780040.50	7138.59	16.34	0.34	d

87 7 5	339 48.98	403384.22	1785513.38	-9244.03	17.16	0.97	c
87 7 5	341 32.12	403795.63	1786315.38	-8493.70	16.85	0.73	c
87 7 5	519 50.65	395816.72	1787574.13	-11606.11	17.32	1.09	b
87 7 5	1253 49.09	404254.59	1782236.00	-9595.61	17.43	1.18	b
87 7 5	1512 4.91	406143.34	1779432.75	-11735.65	17.86	1.51	b
87 7 5	1952 32.01	408633.16	1779908.13	-10654.66	17.41	1.16	c
87 7 6	023 29.18	403124.38	1787454.75	-8725.64	16.80	0.69	b
87 7 6	024 4.56	409783.75	1777717.63	-28911.63	19.25	2.58	d
87 7 6	339 19.99	409339.84	1780303.63	-12072.05	18.08	1.68	a
87 7 6	1045 3.13	397421.34	1784083.38	-22011.45	18.07	1.67	d
87 7 6	1232 10.07	390632.06	1785201.38	-23097.13	18.04	1.64	a
87 7 6	2043 0.81	406929.13	1778251.13	-13059.18	17.62	1.32	a
87 7 7	045 14.89	409417.28	1783021.88	-12980.82	17.44	1.18	a
87 7 7	327 36.99	404596.47	1784061.00	-16368.76	17.77	1.44	a
87 7 7	542 4.81	407906.78	1776546.38	-12307.23	18.00	1.61	a
87 7 7	638 1.86	407418.63	1778006.25	-12213.96	17.53	1.25	a
87 7 7	656 45.08	406982.59	1784701.13	-10628.53	17.42	1.17	c
87 7 7	846 1.96	407285.72	1782844.13	-13311.18	17.66	1.36	a
87 7 7	1328 50.30	404725.41	1785120.13	-6929.69	17.03	0.87	b
87 7 7	1329 39.30	404834.31	1784425.88	-7262.21	17.09	0.92	b
87 7 7	16 3 42.92	409715.50	1787810.00	-12465.45	17.35	1.11	a
87 7 7	1628 19.88	405946.19	1780862.25	-13419.63	17.74	1.42	a
87 7 7	21 3 5.86	408787.03	1782729.75	-13157.45	17.94	1.57	a
87 7 8	4 7 21.05	403721.16	1785982.88	-9429.23	17.28	1.06	b
87 7 8	651 9.31	405201.09	1785405.25	-6791.67	17.21	1.01	b
87 7 8	1110 17.86	408490.13	1785977.75	-13380.07	18.28	1.83	b
87 7 8	1126 3.64	411947.44	1778009.25	-13379.90	18.39	1.92	a
87 7 8	1255 37.28	405661.09	1783539.00	-7704.94	17.34	1.10	b
87 7 8	1657 41.11	403242.47	1782577.38	-26611.59	18.54	2.03	b
87 7 8	1714 42.05	404338.59	1787507.75	8730.86	15.99	0.07	a
87 7 8	2025 51.94	410281.44	1781219.13	-11630.88	17.48	1.21	c
87 7 9	618 26.66	404976.06	1786961.50	-4580.38	16.83	0.72	b
87 7 9	738 1.14	407429.09	1783527.50	-9885.89	17.16	0.97	b
87 7 9	8 6 40.96	408405.78	1783719.13	-11917.84	17.32	1.10	c
87 7 9	1359 6.39	408041.63	1783872.75	-6206.60	16.95	0.81	b
87 7 9	1525 32.78	406715.53	1778231.63	-13273.90	17.78	1.44	a
87 7 9	1545 4.80	407375.63	1781988.50	-13185.09	18.40	1.92	c
87 7 9	1620 1.75	408432.38	1778596.88	-13372.85	18.45	1.96	b
87 710	056 1.07	403411.09	1786328.75	-8963.93	17.04	0.88	c
87 710	056 38.07	403807.44	1786107.25	-8964.54	17.41	1.16	b
87 710	058 10.32	403468.19	1789243.25	-3997.60	16.49	0.45	c
87 710	128 22.08	403658.16	1786168.38	-8749.58	17.32	1.09	b
87 710	742 58.02	407728.97	1782413.38	-11272.35	17.12	0.94	c
87 710	1018 2.94	408856.91	1790950.00	-17535.56	17.57	1.29	d
87 710	1316 49.06	405935.69	1782316.63	-10943.10	17.45	1.19	b
87 710	1539 30.81	397441.69	1789692.25	-12977.31	17.67	1.36	b
87 710	1659 59.54	407833.63	1786081.00	-4086.67	17.12	0.94	b
87 711	1914 15.93	406220.78.	1782649.25	-13439.47	17.23	1.03	b
87 711	2150 33.68	397377.41	1791906.75	-34046.37	18.62	2.09	c
87 712	7 7 18.78	405285.75	1777153.38	-13343.49	17.43	1.17	b
87 712	11 4 45.70	405259.19	1779355.50	-15942.90	17.59	1.30	a
87 712	1515 42.41	407616.09	1776285.88	-18934.42	18.37	1.90	b
87 712	1717 1.34	404731.31	1789138.00	-7361.07	17.74	1.41	d
87 712	1717 25.77	407423.88	1776709.38	-79913.17	19.58	2.83	d
87 712	22 9 41.62	407697.47	1780292.38	-32468.08	18.02	1.63	a
87 713	1630 13.78	407312.31	1786707.25	-13328.68	17.56	1.28	a
87 713	1930 46.44	403765.44	1780967.75	-17404.25	17.77	1.44	c
87 713	1945 5.12	393910.25	1788233.88	17690.45	15.82	-0.06	a
87 714	252 30.39	396573.25	1783605.25	-36580.56	18.56	2.05	d
87 714	1932 42.32	397242.22	1788438.38	-39412.58	18.88	2.29	c
87 714	1937 5.67	396681.88	1794734.25	-17160.48	17.85	1.50	d
87 714	2354 32.76	404879.91	1779403.25	-13184.29	17.77	1.44	b
87 715	343 9.83	406009.50	1780727.38	-13234.41	17.50	1.23	b
87 715	454 15.09	404466.22	1787048.88	-14955.45	18.13	1.72	d
87 715	734 36.21	405371.72	1790417.88	-3413.26	16.91	0.78	b
87 715	1427 40.46	403930.78	1779329.25	-18096.85	17.54	1.26	c

87 715	15 2 50.80	406967.16	1781801.38	-13332.60	17.86	1.50	a
87 715	1614 0.18	404172.59	1785298.25	-15682.90	18.17	1.74	a
87 715	1913 36.81	404303.81	1788512.75	4781.83	16.10	0.16	a
87 715	2020 43.42	406556.41	1786401.38	-5821.16	16.99	0.84	c
87 715	2137 12.66	410742.72	1778144.38	-13477.04	17.51	1.23	a
87 715	2146 44.83	408624.31	1784382.63	-13270.16	17.70	1.38	c
87 715	2354 31.10	407166.31	1790012.38	-9303.20	17.14	0.96	c
87 716	114 33.31	405343.19	1782761.38	-7264.16	16.98	0.83	a
87 716	128 1.72	405913.06	1776468.50	-13477.37	18.33	1.87	a
87 716	2 3 56.28	405934.69	1787781.75	-13359.00	17.12	0.94	a
87 716	239 49.77	410499.94	1778382.63	-13346.65	17.88	1.52	a
87 716	514 37.07	410159.38	1788098.75	-12860.03	17.93	1.56	a
87 716	555 28.32	394305.25	1793167.50	-13064.10	17.90	1.54	a
87 716	1643 25.98	402027.59	1780105.00	-11157.64	17.81	1.47	d
87 716	2052 9.69	405846.44	1776211.38	-13027.45	17.89	1.53	c
87 717	523 24.14	408246.66	1784852.00	-8934.38	17.68	1.37	c
87 717	1939 0.72	407461.91	1778012.63	-13089.15	18.62	2.09	a
87 717	2027 58.79	396604.44	1791226.38	-12989.24	17.79	1.45	c
87 717	2120 57.85	409979.59	1781799.63	-13349.66	17.64	1.34	a
87 717	2246 2.91	406869.75	1779533.88	-12132.66	17.57	1.28	b
87 717	2246 58.08	405085.66	1781343.50	-9352.65	17.67	1.36	c
87 718	523 37.81	405539.69	1780521.63	-13255.92	18.03	1.64	c
87 718	1254 12.71	396541.44	1788528.25	-11946.95	18.00	1.62	b
87 718	2015 35.71	396628.06	1788497.38	-11674.44	17.22	1.02	c
87 719	0 6 44.20	403105.00	1792630.38	-8593.28	17.45	1.20	c
87 719	136 41.12	410346.41	1785947.88	-12975.65	17.78	1.45	b
87 719	316 59.65	410202.34	1776872.25	-15092.49	17.98	1.60	a
87 719	516 2.08	407805.41	1781603.75	-10237.11	17.78	1.45	b
87 719	1240 7.26	404974.72	1784635.88	-7306.65	16.87	0.75	c
87 719	1330 14.58	395458.47	1779925.50	-2764.96	16.75	0.65	c
87 719	17 5 50.98	407210.94	1780601.38	-11917.72	17.70	1.38	a
87 719	1727 2.92	408503.22	1786817.50	-12306.23	17.34	1.11	b
87 719	1832 45.50	397797.00	1794028.38	-3417.56	16.96	0.82	b
87 719	19 5 14.82	407496.69	1783157.13	-49570.46	18.68	2.14	d
87 719	2359 10.69	411712.19	1778170.38	-13380.76	17.70	1.38	a
87 720	010 12.32	403610.25	1788248.63	-14557.84	17.71	1.39	a
87 720	1 0 12.91	392292.81	1800961.00	-13709.03	17.49	1.22	d
87 720	217 53.94	404272.97	1786547.63	-10732.24	17.00	0.84	b
87 720	319 38.27	407910.75	1792036.88	-8943.12	17.25	1.04	c
87 720	615 2.14	402526.59	1787802.13	-7292.84	17.02	0.86	b
87 720	1046 33.46	406170.59	1783795.63	-18706.64	17.30	1.07	d
87 720	15 0 19.89	410435.63	1780648.38	-12890.78	17.53	1.25	a
87 720	16 1 23.82	407465.19	1777440.25	-13335.82	18.06	1.66	a
87 720	1615 30.18	413169.53	1782538.13	-5724.70	17.58	1.29	a
87 720	1724 44.50	400646.38	1788332.25	-2557.09	17.70	1.39	a
87 720	2019 43.98	408459.59	1781532.50	-11572.20	17.95	1.58	c
87 720	2026 46.83	407250.97	1777773.88	-12840.31	18.00	1.62	a
87 720	2226 13.01	408201.75	1781237.13	-13386.61	17.93	1.56	a
87 721	2 2 23.02	397722.53	1791009.63	-13004.06	17.47	1.21	c
87 721	244 24.85	397858.34	1791100.38	-12804.73	17.88	1.53	c
87 721	622 31.03	409630.19	1780546.75	-11805.34	17.22	1.02	a
87 721	1027 43.25	408117.09	1782960.25	-8572.05	17.17	0.98	c
87 721	1043 13.68	409123.31	1778592.50	-16093.22	18.01	1.62	b
87 721	1141 4.02	408288.34	1786456.88	-10684.50	18.20	1.77	c
87 721	1814 29.69	405908.13	1784295.63	-5154.77	17.21	1.01	c
87 721	20 4 3.19	408286.72	1781069.38	-8148.09	18.25	1.81	b
87 721	2154 48.13	410459.25	1783748.38	-8622.25	17.33	1.10	a
87 721	2348 41.94	410744.69	1782300.38	-10552.25	17.42	1.17	b
87 722	0 3 59.66	410784.06	1783335.25	-16359.76	17.58	1.30	a
87 722	1 2 3.87	409064.59	1780411.50	-12257.07	17.80	1.46	a
87 722	440 16.34	404254.59	1782393.75	-6667.91	17.27	1.06	b
87 722	451 10.11	403615.81	1786811.50	-8467.70	17.15	0.96	b
87 722	452 39.04	403518.72	1786338.13	-9297.21	17.59	1.30	b
87 722	650 23.95	407959.28	1780835.25	-12504.09	17.91	1.55	a
87 722	859 50.93	408592.81	1781228.75	-12041.83	17.47	1.21	b
87 722	938 45.89	410584.56	1779233.88	-12145.61	17.52	1.25	a

87	722	11 3 8.33	407018.34	1783049.38	-7703.69	17.00	0.85	b
87	722	1239 4.82	406835.59	1781455.00	-16525.44	17.84	1.49	a
87	722	1310 2.78	404670.94	1778343.75	-12111.37	17.22	1.02	b
87	722	1830 51.45	404486.88	1787731.63	-3353.23	16.82	0.71	b
87	722	19 5 40.61	398452.50	1795741.25	-20221.75	18.11	1.70	c
87	722	1941 27.77	411251.56	1780277.13	-13462.97	17.74	1.42	a
87	722	20 3 8.95	410438.28	1784979.25	-13458.55	18.05	1.66	a
87	723	034 37.75	404253.97	1784913.00	-16238.42	17.23	1.02	a
87	723	343 17.87	406430.75	1783077.13	-13475.02	16.91	0.78	a
87	723	6 4 44.35	408109.56	1786153.75	-6922.41	17.11	0.93	b
87	723	6 6 43.42	405038.72	1786831.00	-5116.47	16.98	0.83	b
87	723	648 32.98	408569.19	1780746.75	-11435.74	17.51	1.24	c
87	723	7 0 28.90	408347.41	1782135.25	-12836.23	17.98	1.60	c
87	723	817 19.13	409100.34	1781979.25	-9421.16	17.15	0.96	c
87	723	834 28.98	398956.78	1787475.38	-10673.14	17.14	0.96	c
87	723	933 54.03	403832.03	1785855.63	-9533.85	17.85	1.50	b
87	723	1042 5.81	410001.25	1780929.75	-13427.68	17.50	1.23	a
87	723	1354 26.80	405149.94	1777245.50	-13221.17	18.14	1.73	a
87	723	1724 49.46	405793.31	1787016.00	-4593.15	16.83	0.71	c
87	723	18 5 34.00	409143.00	1781626.63	-10846.18	17.71	1.39	c
87	723	1847 12.74	410413.63	1778090.75	-13459.85	17.90	1.54	a
87	723	2011 26.73	409234.19	1779851.63	-16898.18	18.12	1.71	a
87	723	2031 29.60	413214.81	1786584.63	-16188.82	17.78	1.45	a
87	723	2135 40.60	405010.81	1785503.38	-3526.22	16.75	0.66	b
87	723	2148 35.91	404633.88	1791351.88	-13342.35	17.71	1.40	a
87	723	2253 43.01	405309.06	1788474.75	-12454.95	17.36	1.13	c
87	723	2335 2.98	398760.91	1791275.75	-13012.97	17.82	1.48	b
87	723	2344 57.91	408793.59	1783724.13	-17020.36	18.02	1.63	a
87	724	1 0 16.84	404870.41	1790852.63	-4358.92	16.50	0.46	b
87	724	144 33.51	404535.44	1789825.00	-1182.98	16.26	0.27	c
87	724	258 8.83	408610.19	1778902.88	-12889.72	17.80	1.46	a
87	724	456 53.83	410497.97	1776981.38	-12610.68	18.09	1.69	a
87	724	457 43.81	410122.63	1779932.13	-13145.87	17.96	1.58	b
87	724	858 54.28	404978.69	1786264.63	-17089.88	17.65	1.35	d
87	724	925 21.89	413219.72	1790834.88	-46555.08	18.54	2.03	b
87	724	946 8.06	407583.31	1794500.13	-16213.33	17.83	1.49	a
87	724	1243 56.29	407303.13	1785189.38	-14355.40	17.93	1.56	b
87	724	15 5 2.80	407930.75	1788074.13	-6067.71	18.14	1.72	c
87	724	1739 26.17	403626.00	1785736.38	-8577.48	18.08	1.68	c
87	724	1825 1.39	405886.78	1782009.25	-14734.70	17.50	1.23	a
87	724	2254 58.19	399250.72	1790529.13	-7747.89	17.48	1.22	b
87	724	23 8 57.46	405657.81	1785224.00	-5147.22	16.78	0.68	b
87	724	2342 2.84	409439.25	1784162.25	-13262.77	17.41	1.17	c
87	725	120 29.67	410967.44	1777942.88	-13476.76	18.05	1.65	a
87	725	146 55.56	411455.97	1776179.00	-13370.30	17.22	1.02	a
87	725	225 17.85	405928.47	1787467.75	-4246.32	17.44	1.18	b
87	725	240 7.10	406722.09	1781242.50	-11140.34	17.97	1.59	a
87	725	247 45.91	408788.69	1783141.50	-13341.76	17.35	1.11	c
87	725	835 38.95	408141.38	1787042.25	-11299.00	17.25	1.03	c
87	725	1122 5.87	408423.84	1780384.50	-12916.54	17.94	1.57	a
87	725	1311 39.45	408766.69	1777704.88	-20705.19	17.73	1.41	b
87	725	1338 33.88	408862.50	1780983.63	-12866.60	17.24	1.03	a
87	725	14 1 11.56	395960.41	1791739.75	-18299.70	17.58	1.29	c
87	725	1425 12.97	408421.56	1786756.25	-10847.38	17.22	1.02	c
87	725	15 4 24.82	409521.94	1779601.13	-12991.71	18.08	1.67	a
87	725	1611 27.62	405503.28	1784891.00	-16517.92	17.55	1.27	a
87	725	1738 50.96	398523.03	1791717.38	-10653.25	17.67	1.36	b
87	725	1814 7.87	408537.03	1783335.25	-13228.23	16.68	0.60	a
87	725	2030 45.96	406416.00	1780909.50	-12468.40	18.39	1.92	a
87	725	2135 7.77	411114.41	1777774.88	-13470.98	17.69	1.37	a
87	725	22 6 6.72	399557.47	1791252.00	-13424.36	17.08	0.90	a
87	726	245 44.88	405393.69	1779473.75	-12432.23	18.44	1.95	a
87	726	528 29.15	407970.09	1782721.50	-9540.60	17.31	1.08	c
87	726	550 45.49	405427.47	1787373.63	-4696.06	16.56	0.51	c
87	726	1530 6.99	396818.00	1792380.75	-10628.30	17.17	0.98	a
87	726	1542 20.41	411594.41	1776093.63	-18514.58	18.30	1.85	c

87 726	16 5 22.03	406807.06	1779034.25	-9926.54	17.61	1.32	a
87 726	18 6 23.12	407059.69	1785742.88	-13150.35	17.49	1.22	a
87 726	19 5 24.70	404753.63	1789585.50	825.85	16.05	0.12	b
87 726	2252 32.94	408361.19	1780655.63	-12449.63	17.30	1.08	a
87 726	2322 53.92	407080.03	1782206.13	-13309.25	17.56	1.28	b
87 726	2352 2.30	390130.44	1785363.63	-37058.05	18.05	1.65	a
87 727	017 6.84	397560.16	1790993.38	-12735.42	17.85	1.50	a
87 727	110 46.85	409277.84	1782868.75	-12793.34	17.41	1.17	a
87 727	144 40.68	410077.72	1778562.63	-16083.02	17.81	1.47	a
87 727	2 8 13.23	392817.41	1788195.25	-25766.79	17.74	1.41	d
87 727	1250 3.43	404674.53	1785710.25	-4998.50	17.06	0.89	b
87 727	1257 28.35	406806.09	1786266.13	-6384.11	16.94	0.80	b
87 727	1441 23.84	411524.19	1780003.63	-11480.68	18.17	1.75	a
87 727	2218 33.98	405820.88	1779265.50	-9271.86	17.37	1.13	c
87 727	23 2 27.51	398724.16	1795531.75	-5257.76	17.16	0.97	a
87 728	010 16.35	407709.63	1782467.38	-6722.17	17.23	1.02	c
87 728	026 14.89	408909.72	1782805.00	-13263.44	17.70	1.38	a
87 728	159 43.73	410176.44	1776278.88	-13132.40	18.69	2.14	a
87 728	220 51.83	406435.69	1779400.25	-13462.40	17.10	0.92	a
87 728	738 46.39	407402.88	1786535.00	-5900.60	16.97	0.82	b
87 728	1214 24.92	407267.34	1781018.13	-13006.25	18.16	1.74	a
87 728	1415 1.44	408760.13	1789113.50	-28241.51	18.05	1.66	d
87 728	1538 4.98	401319.28	1784241.75	-10586.51	18.13	1.71	c
87 728	1645 40.81	400715.94	1796992.50	-2991.52	16.86	0.73	b
87 728	2021 15.58	403521.00	1786949.50	-2092.89	16.86	0.74	b
87 729	129 43.69	405376.97	1780827.50	-17900.85	17.64	1.33	c
87 729	459 34.90	408242.75	1781530.88	-12918.62	17.98	1.60	a
87 729	538 58.90	409527.50	1780043.25	-11849.27	17.54	1.27	b
87 729	624 53.75	407343.16	1786639.13	-4621.95	17.81	1.47	b
87 729	19 4 31.59	402168.66	1788946.50	-3392.09	17.77	1.44	b
87 730	217 45.97	402293.34	1788919.88	5970.58	16.10	0.15	a
87 730	532 57.89	406989.50	1780135.63	-12613.03	18.01	1.62	a
87 730	758 51.86	408012.75	1783885.75	-12942.37	17.29	1.07	a
87 730	944 8.18	408194.84	1782594.25	-9107.01	17.44	1.19	c
87 730	13 2 25.77	411291.25	1781220.13	-13304.50	17.45	1.19	a
87 730	1327 36.77	406329.06	1792916.63	-13833.95	17.71	1.40	d
87 730	1412 50.56	406978.97	1787441.25	-6881.90	17.52	1.25	c
87 730	1514 17.88	408939.59	1781554.50	-13054.15	18.13	1.71	b
87 730	1535 42.24	413002.19	1786274.50	-25363.17	17.57	1.29	c
87 730	1739 50.30	407483.25	1792345.63	-15066.10	17.55	1.27	a
87 731	3 5 37.28	406875.63	1787818.50	-7180.43	17.31	1.09	c
87 731	427 51.72	411643.94	1777322.00	-12636.26	18.23	1.80	a
87 731	543 40.07	399894.09	1791515.25	-9160.71	16.88	0.76	b
87 731	616 40.12	404133.53	1783471.88	-9043.71	17.98	1.60	b
87 731	617 40.17	410739.13	1782879.38	-13282.28	17.69	1.38	a
87 731	619 30.04	406032.16	1790082.38	-3335.88	17.65	1.35	b
87 731	621 37.79	405366.13	1787287.38	-1415.98	16.26	0.28	b
87 731	632 53.78	405267.72	1778024.63	-13310.48	17.99	1.61	a
87 731	634 4.21	403548.56	1785712.63	-8310.72	16.78	0.68	a
87 731	634 37.99	407858.91	1781474.88	-12737.53	17.32	1.09	a
87 731	735 55.56	400644.41	1790918.00	-16556.24	17.25	1.04	a
87 731	828 18.13	406726.38	1785513.13	-10074.74	16.72	0.63	b
87 731	1120 19.99	407513.44	1780388.13	-10602.28	16.83	0.72	b
87 731	1156 26.77	409217.47	1778703.00	-13372.26	17.75	1.42	a
87 731	1246 22.84	408649.56	1776801.38	-12189.09	18.00	1.62	a
87 731	15 1 9.04	412271.59	1779296.00	-10887.16	17.53	1.26	b
87 731	1812 28.65	411341.16	1777184.25	-13416.26	18.02	1.63	a
87 731	1951 55.11	403955.72	1785818.13	-8207.76	16.99	0.84	b
87 731	2015 5.61	402073.84	1791253.00	-16702.81	18.06	1.66	a
87 731	21 9 42.59	410235.50	1776014.63	-14332.05	17.54	1.26	a
87 731	22 8 44.70	412109.50	1776310.75	-11988.67	17.65	1.34	a
87 731	2229 5.16	406336.59	1781040.25	-8643.94	17.19	0.99	b
87 731	2245 50.91	408807.72	1778704.88	-11893.53	17.20	1.00	a
87 731	2331 37.70	401494.13	1790004.25	-1682.38	17.02	0.86	a
87 731	2357 21.59	397436.78	1786009.50	-17091.94	17.68	1.37	a
87 8 1	044 41.81	407641.38	1780029.50	-2665.21	16.43	0.41	b

87 8 1	057	20.69	408222.06	1776034.63	-12968.91	17.56	1.28	b
87 8 1	355	51.94	408025.56	1786850.00	-11404.30	17.48	1.22	c
87 8 1	556	52.00	406252.63	1783505.25	-13332.36	17.83	1.48	a
87 8 1	7 7	51.88	407401.53	1781663.50	-13121.39	17.37	1.13	a
87 8 1	834	3.72	411430.72	1779224.13	-13283.55	17.93	1.56	a
87 8 1	929	1.84	398413.81	1792994.63	-12010.39	17.25	1.04	a
87 8 1	1156	44.84	409045.53	1779261.13	-13058.84	17.76	1.43	a
87 8 1	1217	13.82	405696.50	1780016.50	-13050.98	17.52	1.25	b
87 8 1	1245	32.72	410534.38	1778100.75	-13162.14	17.18	0.98	a
87 8 1	1649	6.42	408054.13	1781992.00	-6451.46	17.01	0.85	c
87 8 1	1712	14.45	391370.56	1785560.38	-34368.38	18.14	1.72	a
87 8 1	1733	59.78	397891.81	1789956.38	-13003.85	18.03	1.64	a
87 8 1	1950	7.50	405418.31	1778745.75	-17528.53	17.47	1.21	b
87 8 1	2136	51.96	407430.75	1781819.63	-12351.68	17.12	0.94	a
87 8 1	2215	8.69	410455.31	1777560.00	-14540.04	17.65	1.35	a
87 8 1	2310	27.92	408018.66	1781942.25	-12615.05	17.45	1.19	a
87 8 1	2312	9.45	400875.72	1787912.13	-4234.87	17.39	1.14	a
87 8 1	2340	38.92	407413.03	1781706.25	-12593.80	17.56	1.27	b
87 8 2	429	52.12	399375.41	1790422.50	-8812.91	17.05	0.88	b
87 8 2	815	15.19	404040.69	1787045.88	-7401.42	16.94	0.80	b
87 8 2	819	0.76	408452.72	1779394.13	-12808.87	17.21	1.01	a
87 8 2	911	20.88	407177.16	1779750.88	-12762.71	17.78	1.45	a
87 8 2	915	5.12	408655.78	1781074.00	-9638.87	17.47	1.21	c
87 8 2	1032	51.26	394512.59	1791253.50	-23565.06	17.98	1.60	d
87 8 2	1141	2.87	406292.97	1780118.38	-13391.30	17.15	0.96	b
87 8 2	1147	26.98	404049.56	1790998.25	-11281.17	17.25	1.04	b
87 8 2	1257	59.32	407582.63	1783740.25	-7633.29	16.98	0.83	c
87 8 2	1321	41.94	407705.69	1781573.50	-12487.56	18.09	1.68	a
87 8 2	1342	18.88	411439.88	1776941.25	-12103.52	17.23	1.03	a
87 8 2	1414	47.91	407628.25	1781286.25	-12814.37	17.75	1.43	a
87 8 2	1417	48.89	408106.94	1781179.88	-12958.85	17.87	1.51	b
87 8 2	1422	25.91	407829.03	1782140.00	-12819.42	17.38	1.14	a
87 8 2	1427	41.11	406534.09	1783343.50	-10260.21	17.06	0.89	c
87 8 2	2213	48.57	395392.19	1792536.75	3748.97	16.32	0.33	d
87 8 3	647	26.91	408004.88	1786236.25	-11770.66	17.56	1.28	c
87 8 3	14 0	24.24	407157.13	1783728.38	-8454.00	17.33	1.10	b
87 8 3	1846	30.74	408997.34	1778502.63	-16132.67	18.96	2.36	a
87 8 4	4 1	52.84	404722.44	1778671.38	-12844.20	18.05	1.65	a
87 8 4	9 3	8.89	408861.50	1777054.50	-10936.71	18.33	1.87	b
87 8 4	1919	12.37	401106.66	1788638.75	-6470.54	17.76	1.43	b
87 8 4	2053	12.11	399856.38	1795569.00	-12875.78	17.52	1.24	a
87 8 5	446	16.12	408984.19	1786990.13	-9131.48	17.15	0.97	c
87 8 5	634	38.52	404500.34	1783750.63	-4712.17	17.15	0.96	a
87 8 5	853	2.92	411301.44	1783437.63	-11563.47	17.23	1.02	c
87 8 5	10 2	53.84	410040.97	1778441.88	-12627.97	18.54	2.03	a
87 8 5	1053	51.82	409869.69	1784026.50	-16553.80	17.53	1.25	a
87 8 5	11 5	44.09	409290.66	1781697.13	-9703.70	17.18	0.98	c
87 8 5	1214	23.67	405589.88	1795692.13	-16390.68	17.18	0.99	a
87 8 5	1351	20.80	406171.25	1787165.38	-13303.55	16.99	0.84	a
87 8 5	1942	19.17	397516.50	1792687.50	-13290.71	17.95	1.58	a
87 8 5	22 2	34.73	401538.09	1789540.63	-2461.20	17.34	1.10	a
87 8 5	2333	23.66	397909.22	1786389.88	-13067.69	17.71	1.39	a
87 8 6	655	36.77	394093.00	1783008.25	-12562.44	17.27	1.05	b
87 8 6	753	7.76	409976.97	1779034.88	-13459.34	18.39	1.91	a
87 8 6	754	33.24	407268.03	1780086.88	-7964.52	17.51	1.24	a
87 8 6	755	15.89	409244.03	1778363.63	-12138.02	17.26	1.04	c
87 8 6	833	20.20	405944.22	1784609.25	-8034.02	16.79	0.68	c
87 8 6	1528	40.70	406684.38	1776321.38	-12276.24	18.27	1.82	a
87 8 6	1529	9.75	400082.41	1789879.50	-13104.19	18.59	2.07	a
87 8 6	1649	0.09	407939.28	1784813.88	-9875.11	17.18	0.98	c
87 8 6	1811	23.56	412069.47	1777305.00	-14710.91	17.80	1.46	a
87 8 6	1941	49.97	409459.59	1782203.13	-10938.41	18.07	1.67	b
87 8 6	2110	0.76	407031.47	1784812.88	-2214.46	16.53	0.49	c
87 8 6	2354	17.05	408487.50	1784718.38	-13470.07	18.13	1.71	a
87 8 7	129	40.72	409435.66	1777391.88	-13392.61	18.50	2.00	a
87 8 7	240	2.51	403277.25	1785713.63	-3097.50	16.86	0.74	b

87 8 7	426	2.94	409160.72	1778290.75	-10621.87	18.27	1.82	b
87 8 7	456	3.82	406045.25	1777681.25	-12682.01	17.63	1.33	a
87 8 7	1239	45.65	411779.13	1778009.63	-17804.34	18.13	1.71	a
87 8 7	1334	32.85	408478.97	1780158.25	-13089.17	17.96	1.59	a
87 8 7	1351	18.48	407700.09	1786378.75	-7376.44	17.28	1.06	c
87 8 7	1459	28.07	409137.09	1783635.50	-10317.82	17.50	1.23	b
87 8 8	7 6	6.81	409091.16	1779656.75	-13255.86	17.87	1.52	a
87 8 8	823	31.46	412713.50	1776679.63	-16323.54	17.69	1.37	a
87 8 8	1614	14.92	401277.28	1786301.75	-16572.14	17.22	1.01	a
87 8 8	1637	40.45	404251.31	1785357.13	-4280.17	16.58	0.52	b
87 8 8	21 7	52.86	409429.09	1780340.88	-12782.17	17.76	1.43	a
87 8 8	2132	47.79	411655.44	1777066.63	-12183.16	17.43	1.17	a
87 8 8	2141	15.58	407440.91	1785704.00	-3580.42	16.52	0.47	c
87 8 8	2310	29.75	409341.47	1776686.25	-13466.80	17.87	1.52	a
87 8 9	046	19.79	407420.91	1785632.88	-4485.44	17.41	1.16	a
87 8 9	221	51.39	406309.03	1788384.50	-6082.71	16.87	0.75	c
87 8 9	640	56.08	407295.25	1779219.50	-9541.06	17.65	1.34	c
87 8 9	750	2.78	398052.91	1796224.25	-17123.55	17.78	1.45	c
87 8 9	1318	22.89	406996.69	1780064.75	-13046.85	18.24	1.80	b
87 8 9	1529	59.33	407574.78	1784221.13	-7298.66	16.97	0.82	b
87 8 9	1843	6.78	408366.09	1776041.38	-12268.79	17.84	1.49	a
87 8 9	2217	47.29	405255.25	1785454.13	-8915.35	17.15	0.96	b
87 810	1 4	56.79	409236.19	1778311.38	-13212.80	18.19	1.76	a
87 810	114	26.81	408244.41	1776439.25	-12181.53	18.11	1.70	a
87 810	216	52.94	404511.81	1792577.63	-12298.69	17.18	0.98	c
87 810	828	19.90	409286.69	1780744.75	-12673.75	17.84	1.49	a
87 810	927	6.87	391997.53	1786101.13	-10384.91	17.84	1.49	c
87 810	949	48.79	409754.53	1779438.75	-13075.44	18.10	1.69	a
87 810	1036	4.36	403084.34	1786430.50	-6397.98	16.83	0.72	c
87 810	1138	5.92	406560.00	1781700.13	-16473.88	17.50	1.23	a
87 810	17 1	32.85	408648.91	1780654.63	-13218.27	18.45	1.96	a
87 810	1940	15.95	398595.56	1791765.63	-11034.16	17.64	1.34	c
87 810	1945	37.80	409260.13	1779480.00	-13083.19	18.41	1.93	a
87 810	2134	48.67	401934.09	1789892.25	-1988.87	17.12	0.94	a
87 810	2340	3.16	404119.44	1786179.38	23033.73	15.27	-0.48	a
87 811	213	0.96	407206.00	1778350.25	-10879.46	17.44	1.18	c
87 811	442	22.75	406658.78	1776384.00	-13150.61	18.40	1.92	a
87 811	510	22.92	409281.47	1783157.88	-13417.18	18.29	1.84	a
87 811	527	6.86	406630.22	1778113.50	-12959.08	18.04	1.65	a
87 811	659	16.64	410263.72	1782498.63	-16366.02	17.72	1.40	c
87 811	939	49.85	404143.72	1792482.50	10883.53	16.46	0.43	a
87 811	19 0	0.80	408642.03	1781243.50	-13343.33	16.94	0.80	b
87 811	2051	48.87	402837.63	1790752.00	-2481.70	16.98	0.83	a
87 811	2347	53.03	407607.91	1782132.88	-10791.97	17.78	1.45	a
87 812	011	35.97	410387.41	1780633.63	-12795.10	17.42	1.17	a
87 812	055	45.95	408444.50	1787205.63	-10949.71	17.61	1.31	c
87 812	1 3	48.81	410876.56	1781635.38	-12968.75	17.61	1.31	a
87 812	429	51.76	406716.84	1776964.38	-13479.38	17.77	1.44	a
87 812	1748	26.79	406912.38	1785739.25	-2592.22	17.32	1.09	b
87 812	19 5	48.96	398155.59	1782295.00	-521.85	16.81	0.70	b
87 812	2052	53.48	409638.72	1784696.50	-3910.99	17.07	0.90	b
87 812	2057	45.99	408531.78	1786098.50	-10505.22	17.96	1.58	b
87 812	2121	40.51	396619.84	1800439.75	-12510.93	17.73	1.41	b
87 812	23 6	0.72	407590.53	1786115.50	-4456.57	17.17	0.97	b
87 812	2334	52.05	408677.13	1783842.50	-13481.66	18.29	1.84	a
87 813	326	27.88	408137.75	1782356.25	-13315.19	17.66	1.35	b
87 813	641	35.00	410749.94	1786234.63	-13327.92	17.56	1.28	a
87 813	7 7	20.85	410903.81	1777571.88	-12574.37	17.53	1.26	a
87 813	10 7	12.69	411666.91	1776947.25	-13175.84	17.72	1.40	a
87 813	1320	49.79	408222.75	1776361.38	-12794.64	17.48	1.21	a
87 813	1323	12.99	403348.44	1782944.63	-12350.78	18.14	1.72	a
87 813	1819	36.49	405250.66	1784096.38	-5510.35	17.31	1.09	b
87 813	1859	12.95	408324.13	1781960.63	-11871.56	17.49	1.22	b
87 813	1938	51.28	407668.63	1784027.50	-7869.95	17.03	0.87	b
87 813	2150	35.38	402562.03	1788432.88	-4155.48	16.60	0.54	b
87 814	011	40.65	401401.94	1794785.63	-5379.64	17.07	0.90	b

87	814	025	51.77	409085.59	1778096.88	-13326.92	18.13	1.71	a
87	814	042	19.94	404394.69	1780996.63	-13329.99	17.16	0.97	c
87	814	153	29.17	405891.41	1783205.75	-24211.72	18.34	1.88	b
87	814	254	28.82	395627.75	1791831.88	-12507.11	17.28	1.06	a
87	814	528	28.61	405049.56	1786355.13	-16310.02	17.85	1.50	a
87	814	1229	18.67	411237.78	1777582.63	-13374.82	18.27	1.82	a
87	814	19 9	14.74	408636.78	1776933.88	-13406.45	18.67	2.13	a
87	815	035	27.66	411159.06	1776701.75	-13278.51	18.38	1.90	a
87	815	128	4.89	405151.25	1780887.13	-13430.01	18.13	1.71	b
87	815	129	14.58	404768.06	1780863.25	-16813.60	17.18	0.99	a
87	815	233	56.99	406778.84	1781356.88	-12430.45	17.77	1.43	c
87	815	248	12.91	408448.78	1779867.13	-12759.78	17.90	1.53	a
87	815	12 3	45.03	405770.66	1794248.63	-12954.22	17.39	1.14	a
87	815	1452	24.78	398081.13	1796903.63	-17251.73	18.14	1.72	a
87	815	1534	59.36	411480.25	1783806.13	-11791.40	17.99	1.61	b
87	815	19 8	52.04	405234.56	1792173.13	-9123.04	17.31	1.09	b
87	816	029	52.11	405264.13	1779562.75	-12001.25	17.18	0.99	c
87	816	4 2	58.71	408651.22	1777111.88	-13033.58	17.30	1.08	a
87	816	457	15.74	405209.31	1784970.50	-2797.17	16.48	0.45	c
87	816	13 0	21.80	409679.06	1776801.38	-11895.00	17.61	1.31	a
87	817	0 4	4.11	403966.22	1786748.25	-8034.55	17.05	0.88	b
87	817	120	52.93	406999.31	1782972.50	-12674.63	17.33	1.10	c
87	817	616	31.91	407926.81	1781246.75	-12373.58	17.42	1.17	a
87	817	819	45.04	409172.84	1781456.75	-12233.19	17.27	1.05	a
87	817	941	50.19	405041.00	1781927.63	-9095.22	17.34	1.11	c
87	817	946	35.84	406222.44	1780381.25	-13201.66	18.54	2.03	b
87	817	1338	9.98	410218.44	1791236.50	-7944.48	17.98	1.60	c
87	817	1358	28.98	409448.13	1783841.13	-11894.08	18.09	1.69	a
87	817	1523	34.19	404500.34	1792725.50	-8309.97	16.97	0.82	b
87	817	2219	15.71	409723.69	1776412.00	-13246.59	17.89	1.53	a
87	818	0 4	47.44	392330.88	1776255.13	-54452.16	19.15	2.50	c
87	818	344	51.81	406982.59	1779116.13	-16313.03	18.17	1.75	a
87	818	1825	55.18	407763.44	1782227.00	-8455.95	18.02	1.63	b
87	818	2332	57.71	408706.97	1776059.88	-13174.00	17.48	1.22	b
87	819	623	54.09	403774.63	1786069.88	-8404.82	17.03	0.87	b
87	819	2055	32.16	403471.16	1788509.38	6214.77	16.88	0.75	c
87	820	213	38.76	409418.91	1777502.75	-13478.87	18.66	2.12	a
87	820	222	56.94	405365.16	1788718.00	-16619.30	17.26	1.04	a
87	820	233	42.59	405803.47	1785917.00	-17281.88	17.37	1.13	c
87	820	624	1.47	406125.31	1784240.25	-5790.50	16.92	0.78	c
87	820	2018	50.57	402358.66	1785348.13	-3427.92	17.09	0.91	b
87	820	2250	49.70	405826.13	1787371.63	-1457.31	16.57	0.52	a
87	821	3 8	21.72	412866.06	1799397.63	1793.49	16.95	0.80	c
87	821	450	50.97	410728.28	1784395.38	-13154.08	17.44	1.19	a
87	821	458	57.78	409887.44	1777109.75	-12493.39	18.20	1.77	a
87	821	459	25.26	396031.59	1776972.13	-35125.10	19.51	2.77	d
87	821	5 4	21.94	408433.03	1780741.50	-12229.92	17.34	1.11	b
87	821	1151	58.00	404305.47	1789176.38	-16636.74	17.13	0.95	a
87	821	1249	10.91	405562.66	1789459.00	-12966.11	16.85	0.73	a
87	821	1937	12.32	406002.94	1778605.38	-7516.88	17.77	1.44	c
87	822	935	10.82	397680.88	1788513.75	-10954.14	17.49	1.22	b
87	822	1246	49.01	406978.31	1778875.63	-12035.87	17.11	0.93	d
87	822	1432	55.67	411954.31	1783201.75	-17421.91	17.67	1.36	a
87	822	1644	35.76	409837.53	1778070.88	-13180.52	16.94	0.80	a
87	822	17 3	28.91	407493.06	1780570.38	-13036.51	17.38	1.14	b
87	822	18 2	51.52	390387.31	1797959.13	-18180.55	18.06	1.66	b
87	822	2057	14.17	399423.97	1792797.88	6653.66	16.28	0.29	a
87	822	22 5	40.79	408682.38	1781638.88	-13288.31	17.35	1.11	a
87	822	2313	6.87	407241.78	1780294.63	-12756.35	17.62	1.32	a
87	823	1046	53.90	406794.59	1780283.13	-13334.89	17.44	1.18	a
87	823	1128	41.77	408786.38	1779678.38	-13311.43	18.53	2.02	a
87	823	1351	41.84	409493.06	1782316.63	-13288.73	17.74	1.42	a
87	823	1355	29.01	403055.47	1786275.25	-9123.56	17.02	0.86	b
87	823	1356	48.78	402848.13	1790601.50	-13026.66	17.39	1.15	a
87	823	1445	26.02	403821.88	1780009.88	-10199.96	17.56	1.28	b
87	823	1526	13.78	405154.53	1782110.00	-13454.87	17.39	1.14	d

87 823	1733	13.98	410184.34	1786474.75	-16672.34	17.41	1.16	a
87 823	1750	44.03	403740.81	1781819.25	-9433.51	17.62	1.32	b
87 823	2220	5.05	405153.22	1792916.00	-12513.20	17.49	1.22	a
87 823	2258	29.29	401787.13	1800470.13	-15509.08	18.14	1.73	a
87 824	724	59.16	405349.41	1781395.13	-9418.35	17.46	1.20	b
87 824	1615	11.94	404892.06	1779855.25	-11056.07	17.91	1.55	c
87 824	2017	9.22	403865.84	1787033.38	-6628.02	16.98	0.83	b
87 825	032	14.92	410787.34	1783039.75	-12464.26	17.61	1.32	b
87 825	044	29.00	402411.47	1785710.00	-8768.00	17.55	1.27	b
87 825	322	35.67	405544.94	1776052.25	-12530.17	17.48	1.21	b
87 825	420	17.10	408269.00	1788428.13	-9345.04	16.74	0.65	c
87 825	449	3.79	401737.91	1782618.88	-12108.37	16.97	0.82	c
87 825	651	10.13	404789.06	1794658.75	-1405.03	17.37	1.13	b
87 825	653	34.79	403178.84	1790014.50	-13031.22	17.53	1.25	a
87 825	831	0.90	404587.28	1778900.88	-12227.96	16.83	0.72	b
87 825	942	6.78	403736.91	1790170.25	-13480.99	17.65	1.35	a
87 825	1050	20.16	405081.38	1791623.00	-221.36	17.34	1.11	c
87 825	2333	0.73	407836.94	1776034.75	-13319.41	17.54	1.26	a
87 826	1 7	8.54	406856.28	1788394.63	-6429.18	17.33	1.10	b
87 826	758	24.00	407350.72	1783323.88	-12704.13	18.01	1.62	a
87 826	1221	40.05	407765.38	1782455.38	-10816.09	17.54	1.26	b
87 826	1855	55.39	405881.56	1783442.88	-7011.37	17.21	1.01	a
87 826	2051	20.61	401902.94	1790063.50	-2613.34	17.13	0.95	a
87 826	2124	0.16	403414.38	1786030.38	-7747.57	17.05	0.88	b
87 826	2217	55.93	408985.19	1781470.38	-11387.61	17.60	1.31	c
87 827	149	18.32	392972.28	1782856.88	-11044.10	17.41	1.16	a
87 827	3 6	3.93	409083.28	1785073.25	-12315.98	17.27	1.05	c
87 827	615	43.06	407189.28	1785380.75	-10920.64	17.42	1.17	c
87 827	1412	11.38	406859.22	1782823.88	-8269.52	17.61	1.32	b
87 827	1554	43.06	410333.91	1785220.25	-13468.77	17.99	1.60	a
87 827	1910	46.48	408478.31	1788995.63	-9080.31	17.76	1.43	b
87 827	2130	43.11	403473.44	1786307.75	-8266.10	17.61	1.31	b
87 827	22 2	30.97	403712.63	1787988.13	3096.56	16.95	0.81	b
87 828	016	48.90	406853.97	1779289.38	-12845.84	17.40	1.15	a
87 828	155	5.63	408186.00	1791402.50	-16907.82	17.41	1.16	c
87 828	1017	2.73	409015.03	1778344.63	-13399.08	18.01	1.62	a
87 828	1034	14.87	403958.34	1788702.00	-2170.71	16.78	0.68	b
87 828	14 2	32.80	398110.00	1795248.25	-16020.04	18.28	1.83	a
87 828	16 2	30.28	406475.06	1780825.38	-15531.77	17.89	1.53	a
87 828	1743	13.87	407511.78	1779946.13	-13466.90	18.27	1.83	a
87 828	2027	5.53	399874.41	1790154.25	-3494.45	16.84	0.72	b
87 829	318	5.71	405878.94	1776256.25	-13447.31	17.59	1.30	a
87 829	4 8	52.20	406114.81	1782488.50	-22764.42	18.02	1.63	c
87 829	426	32.72	409285.06	1777530.88	-13287.04	18.36	1.89	a
87 829	632	49.13	404397.66	1781534.13	-9468.32	17.59	1.30	b
87 829	12 0	40.81	410268.00	1777935.13	-12566.95	17.76	1.43	a
87 829	1248	27.86	399431.19	1792936.00	-13242.51	17.05	0.88	a
87 829	2219	58.78	404882.88	1779046.63	-13176.31	18.23	1.79	b
87 829	2316	56.59	405726.38	1787074.50	-2986.46	16.61	0.55	b
87 830	346	43.57	413055.34	1778540.50	-15489.57	17.40	1.15	d
87 830	1010	51.66	396996.16	1787892.25	-12448.74	17.29	1.07	b
87 830	1025	7.41	395312.78	1784393.63	-14390.51	17.51	1.24	a
87 830	1445	36.62	413455.28	1785646.75	-16305.99	17.52	1.25	c
87 830	1722	40.23	408201.41	1782788.38	-7633.81	17.26	1.05	c
87 830	1724	34.80	409111.50	1780942.38	-13195.66	18.14	1.73	a
87 830	1732	28.85	402851.06	1783767.38	-11293.83	18.19	1.76	c
87 830	1734	7.26	406523.94	1782232.00	-6890.31	17.38	1.13	a
87 830	18 2	50.78	411087.22	1783082.38	-16058.03	17.54	1.27	a
87 830	1942	53.69	402961.31	1783844.50	-4844.04	17.91	1.55	b
87 830	2255	13.72	411724.00	1777506.63	-13434.19	17.39	1.15	b
87 831	0 4	58.87	408498.97	1779485.25	-13382.55	17.11	0.93	c
87 831	154	5.87	408657.13	1784702.75	-13456.02	17.21	1.01	c
87 831	1052	18.10	404463.59	1780807.88	-9566.68	17.32	1.09	c
87 831	1152	41.73	408538.34	1777831.75	-13268.64	18.05	1.66	a
87 831	1233	16.01	404539.69	1780815.25	-9757.56	17.91	1.55	b
87 831	1435	0.57	393851.19	1788275.50	-12934.79	17.68	1.37	a

87 831	1522	44.71	407306.41	1776408.50	-13471.90	17.58	1.30	a
87 831	1928	18.96	408085.59	1781289.00	-11443.43	16.90	0.77	c
87 9 1	141	46.85	408762.75	1788533.38	130.78	16.20	0.23	b
87 9 1	455	52.66	411046.19	1777081.63	-13280.99	17.45	1.19	a
87 9 1	856	4.66	409065.91	1776869.38	-14578.09	18.35	1.88	b
87 9 1	9 4	44.21	405383.22	1782377.75	-10376.50	17.12	0.94	b
87 9 1	1328	5.81	402004.00	1777920.25	-10586.60	17.83	1.49	d
87 9 1	1350	53.01	409498.66	1780582.38	-11280.05	17.16	0.97	b
87 9 1	1357	55.10	403759.19	1786883.25	-8596.58	17.63	1.33	b
87 9 1	2311	28.46	392509.34	1785660.38	-16622.61	17.79	1.46	a
87 9 2	320	26.68	410219.44	1777302.50	-13185.56	18.39	1.92	a
87 9 2	816	40.48	405716.53	1781347.88	-15201.91	17.63	1.33	b
87 9 2	2213	17.34	409339.53	1784568.75	-49703.40	18.62	2.09	d
87 9 2	2356	49.77	404557.44	1777466.00	-13102.41	18.09	1.69	a
87 9 3	2133	0.75	407226.03	1777244.88	-12414.14	18.48	1.98	b
87 9 3	2144	56.75	408365.44	1784809.13	-16642.51	17.53	1.25	a
87 9 4	2011	27.93	393857.44	1797752.63	-13064.44	17.60	1.30	c
87 9 5	038	31.07	404364.19	1781372.13	-9604.25	17.63	1.33	c
87 9 5	054	39.22	401501.03	1788775.13	-14686.68	17.30	1.07	c
87 9 5	556	59.16	404643.38	1787696.38	-7787.26	17.03	0.87	b
87 9 5	1553	53.16	392558.53	1781342.25	-13729.68	17.60	1.31	b
87 9 5	1929	34.45	406074.16	1787140.38	-5556.43	16.74	0.65	b
87 9 5	2051	54.17	392698.97	1785702.00	-19620.94	18.22	1.78	a
87 9 5	2311	14.06	410067.84	1788479.00	-8798.07	16.81	0.70	c
87 9 6	242	17.79	397710.72	1794448.00	-15980.26	17.63	1.33	b
87 9 6	5 9	4.78	396506.34	1788378.88	-9745.65	17.91	1.55	c
87 9 6	813	7.01	413557.66	1785599.00	-9134.98	17.53	1.26	c
87 9 6	14 3	8.16	404398.31	1791638.38	-8290.77	16.97	0.83	b
87 9 7	430	12.21	396544.72	1790913.38	-3055.52	17.73	1.41	a
87 9 7	726	36.96	405506.88	1788074.63	-10407.22	17.19	0.99	c
87 9 7	19 7	43.65	399890.47	1793620.63	-4995.75	16.80	0.69	c
87 9 7	2020	41.71	407921.56	1776584.50	-13402.38	17.95	1.58	a
87 9 8	1621	4.93	409120.38	1788671.63	-13429.79	17.69	1.38	b
87 912	051	11.83	409282.09	1782043.75	-12399.15	18.30	1.84	b
87 912	347	25.87	404748.69	1781671.25	-16445.54	17.65	1.35	a
87 912	1734	19.83	405795.25	1778624.38	-16206.36	18.19	1.76	a
87 912	2043	9.29	397703.16	1777230.63	-4700.92	17.51	1.24	b
87 912	2338	38.15	408147.28	1786610.50	-8315.50	17.29	1.07	b
87 913	322	43.07	403283.50	1788475.63	-8678.89	17.45	1.19	b
87 913	516	55.79	409487.47	1781292.38	-13252.74	17.52	1.25	a
87 913	733	58.36	409944.16	1777546.00	-13456.63	18.24	1.80	a
87 913	916	31.76	399119.16	1790552.50	-13122.79	17.56	1.28	a
87 913	928	25.24	398460.72	1794336.75	-6911.43	17.03	0.87	c
87 913	12 8	37.83	408032.44	1779066.75	-13203.35	18.55	2.04	a
87 913	1250	40.78	409212.22	1779533.50	-13279.63	18.42	1.94	a
87 913	1252	4.96	408382.50	1786466.13	-10846.34	17.16	0.97	c
87 913	1326	56.12	406352.00	1786404.25	-13313.49	16.98	0.83	a
87 913	16 0	6.22	399381.97	1791987.50	-7419.31	17.35	1.12	b
87 913	17 0	23.42	399388.84	1792771.75	-4428.50	16.89	0.76	b
87 913	2016	57.98	401881.28	1793353.88	-10982.16	17.85	1.50	b
87 913	2041	25.96	404451.44	1792579.63	-12368.66	17.44	1.19	b
87 914	333	4.98	398745.81	1795386.38	5861.66	16.74	0.65	a
87 914	624	23.11	406044.94	1783362.13	-9810.07	17.11	0.93	c
87 914	910	48.54	400075.53	1795378.13	-17822.39	17.44	1.18	c
87 914	1223	54.01	406708.66	1780273.00	-9309.53	17.94	1.57	c
87 914	18 2	4.08	404662.41	1786303.75	-8524.99	17.70	1.39	b
87 914	2216	34.69	413442.47	1780309.75	-31534.33	17.94	1.57	b
87 915	251	59.01	406603.66	1783755.63	-16413.35	17.41	1.16	a
87 915	256	21.31	404247.72	1795453.88	-9917.91	17.29	1.07	a
87 915	348	37.44	408143.66	1776310.50	-17770.78	18.14	1.72	c
87 915	718	21.40	406123.03	1785185.38	-6543.44	17.34	1.11	a
87 915	1511	37.34	396460.72	1795457.50	-5187.25	17.23	1.02	a
87 915	1553	38.88	407645.97	1781197.25	-12990.94	18.30	1.85	b
87 915	1713	46.53	402447.19	1785554.75	-3931.20	16.53	0.49	b
87 916	049	6.01	407573.81	1778487.63	-9671.38	17.29	1.07	d
87 916	1 9	7.77	410521.91	1780313.63	-13065.25	18.23	1.80	a

87 916	547	27.03	406298.88	1784407.38	-16581.60	17.89	1.53	a
87 916	1658	56.80	408853.63	1777904.25	-13009.64	18.72	2.17	a
87 916	19 7	22.48	402492.81	1788742.13	25544.34	14.08	-1.40	a
87 916	2037	45.81	406342.81	1788177.25	-1972.65	16.91	0.78	c
87 916	2115	30.56	413271.22	1777861.00	-13465.54	18.68	2.14	a
87 916	2133	36.47	412865.06	1776427.25	-16328.52	18.25	1.81	b
87 917	013	47.41	404098.44	1787308.38	-4441.40	16.70	0.62	b
87 917	020	18.33	405354.31	1786001.38	-6739.81	17.15	0.96	b
87 917	5 3	46.28	406543.63	1784861.13	-7633.83	17.16	0.97	b
87 917	929	19.86	407043.28	1792412.00	-13157.24	17.20	1.00	c
87 917	1324	18.06	407165.31	1781381.50	-10286.83	17.98	1.60	c
87 917	1325	35.32	406214.91	1784598.00	-7527.53	17.31	1.09	b
87 917	1656	32.83	406215.22	1792466.88	-13274.99	17.51	1.24	b
87 917	1731	35.19	410872.31	1785648.88	-7969.21	17.23	1.02	b
87 917	1848	41.56	405525.91	1783802.88	-4917.59	16.68	0.60	a
87 917	1854	32.04	396571.31	1784758.38	-9654.33	17.45	1.19	b
87 917	19 3	48.71	412451.34	1777861.00	-13070.46	18.18	1.76	a
87 917	2224	43.94	403297.25	1785460.63	-11171.97	17.69	1.37	c
87 917	2227	33.11	394608.06	1801694.63	-150387.94	20.08	3.21	d
87 918	811	48.41	406032.16	1789896.50	-22904.46	18.00	1.61	b
87 918	1235	37.38	407482.91	1776538.38	-13300.99	17.17	0.98	b
87 918	1819	1.75	411673.47	1779017.38	-13449.53	18.24	1.80	a
87 918	2054	46.69	410132.81	1787139.75	-2406.16	16.48	0.44	b
87 919	1 5	0.24	397914.13	1791838.00	-5523.88	16.95	0.81	b
87 919	630	40.87	407830.66	1783120.38	-12884.50	17.26	1.04	c
87 919	651	48.64	412080.28	1778209.63	-12905.06	18.24	1.80	a
87 919	918	55.66	409864.78	1776292.25	-13319.25	18.37	1.90	a
87 919	1028	6.63	405823.50	1786259.88	-16351.22	17.47	1.21	a
87 919	1710	13.79	409629.53	1778436.13	-13099.15	17.92	1.55	a
87 919	1711	15.67	404940.63	1776071.88	-11585.94	17.80	1.46	b
87 920	427	24.13	398179.56	1792358.13	-7337.72	16.96	0.81	c
87 920	1215	31.80	409332.94	1781332.63	-13427.03	17.80	1.46	a
87 920	1822	9.99	407881.84	1784196.75	-13258.61	17.36	1.13	a
87 920	1823	18.84	410888.41	1780988.63	-12248.82	18.29	1.84	a
87 920	1920	36.00	409537.03	1781189.25	-10582.87	17.55	1.27	c
87 921	2 2	53.93	408310.66	1780566.88	-11266.98	17.91	1.55	c
87 921	518	21.89	410152.81	1782592.75	-12140.47	18.33	1.87	a
87 921	15 1	19.49	405431.09	1786105.88	-4188.02	16.92	0.78	b
87 921	21 5	34.98	403518.72	1788234.25	-35889.07	18.48	1.98	c
87 921	23 8	35.08	403543.66	1786672.00	-8526.59	17.74	1.41	b
87 922	254	6.76	409824.09	1779324.75	-13428.65	17.62	1.33	a
87 922	613	40.19	405833.66	1782352.13	-9183.75	17.52	1.24	c
87 922	617	12.23	405375.66	1783676.13	-8349.19	17.50	1.23	b
87 922	7 1	58.26	405312.66	1783275.00	-8290.00	17.22	1.02	a
87 922	827	1.23	404154.22	1786939.88	-6781.67	17.17	0.98	b
87 922	1127	7.25	398210.72	1792727.13	-5771.66	17.12	0.94	b
87 922	15 8	13.47	410375.59	1785561.38	-18073.20	17.50	1.23	b
87 922	1711	39.81	396869.19	1791429.75	-11906.96	17.60	1.31	b
87 922	2237	50.95	405022.31	1791391.75	-11686.18	17.31	1.09	c
87 923	2 7	15.79	402697.84	1788005.63	-13154.61	17.43	1.18	a
87 923	259	50.71	409381.50	1777293.75	-13053.46	17.91	1.55	a
87 923	310	6.95	407233.56	1780663.88	-13466.91	17.29	1.07	a
87 923	5 4	34.23	396227.16	1795580.25	-7996.28	17.50	1.23	c
87 923	941	52.74	409551.47	1777176.13	-13291.41	17.61	1.31	a
87 923	1551	31.05	407368.41	1781744.13	-10548.37	17.62	1.33	c
87 923	2259	1.80	406448.16	1779950.75	-13403.96	17.02	0.86	c
87 924	055	24.82	399571.91	1791040.25	-13327.04	17.90	1.54	c
87 924	056	14.09	398206.78	1791610.38	-10532.36	17.63	1.33	c
87 924	142	14.28	405561.03	1783745.75	-8041.87	17.30	1.08	c
87 924	145	6.82	407596.75	1778363.88	-12549.16	17.30	1.08	a
87 924	2 1	55.74	406557.06	1786567.63	-1929.62	16.65	0.58	b
87 924	3 4	3.93	397755.34	1791928.38	-11805.08	17.68	1.37	c
87 924	358	51.74	396126.41	1791771.63	-13282.01	17.46	1.20	a
87 924	6 0	22.89	406928.47	1782268.00	-13177.58	17.34	1.10	a
87 924	1212	3.19	404049.56	1785537.38	-8388.99	17.35	1.12	d
87 924	1249	47.78	399701.84	1790225.88	-11924.64	18.56	2.04	a

87 924	1251 38.22	405583.00	1782697.88	-8612.91	17.16	0.97	c
87 924	13 1 6.34	404657.16	1783587.63	-6679.88	17.32	1.09	b
87 924	1444 24.49	404764.09	1784846.13	-4421.58	16.98	0.83	b
87 924	2127 8.99	406062.97	1778936.13	-10673.70	17.40	1.15	b
87 925	351 54.39	404261.50	1787013.38	-4428.96	16.88	0.76	b
87 925	8 3 19.04	406627.59	1787486.50	-9070.17	16.83	0.71	c
87 925	1029 50.58	400205.44	1803907.63	28359.21	12.44	-2.66	a
87 925	1157 39.85	407270.97	1779211.13	-13062.96	18.20	1.77	a
87 925	1311 5.05	404490.81	1786589.25	-9107.22	17.33	1.10	b
87 925	1843 53.71	410597.03	1784145.88	-16816.12	17.93	1.56	a
87 925	2041 47.13	404211.63	1786588.50	-8079.39	17.69	1.38	b
87 925	2224 25.70	412937.25	1784165.13	-12658.50	17.61	1.31	a
87 925	2226 12.32	397956.44	1793115.00	-4288.23	17.03	0.87	c
87 926	038 58.61	411603.25	1776602.13	-13447.13	18.25	1.80	a
87 926	135 41.48	405814.63	1785779.88	-4583.65	17.01	0.85	c
87 926	239 10.84	408501.94	1780112.00	-13065.47	18.29	1.84	a
87 926	1211 33.82	404423.56	1789781.13	-13076.93	16.92	0.78	a
87 926	1320 3.72	409819.81	1778343.63	-13435.78	17.76	1.43	a
87 926	1338 41.79	409573.75	1776371.38	-12827.32	17.63	1.33	a
87 926	1650 40.03	407752.28	1779952.38	-10730.24	17.93	1.56	c
87 926	1815 9.79	408642.34	1778421.88	-12981.68	17.58	1.29	c
87 927	013 6.94	407299.53	1780908.75	-12738.23	18.14	1.73	b
87 927	216 22.61	411733.84	1777777.38	-12992.79	17.78	1.45	a
87 927	4 1 10.09	404183.09	1781713.50	-10740.24	17.70	1.38	a
87 927	458 2.71	409998.97	1777166.75	-13326.54	17.62	1.32	a
87 927	1237 38.88	400294.03	1795579.63	-13548.22	17.13	0.94	d
87 927	1339 18.88	408529.16	1781059.38	-12723.00	18.27	1.82	a
87 927	1343 32.09	407124.66	1783599.00	-12738.22	17.61	1.31	a
87 927	1355 43.82	412058.00	1780269.13	-12373.86	17.67	1.36	b
87 927	1445 56.90	407630.22	1787510.13	-10981.66	17.09	0.92	b
87 928	336 48.91	410564.56	1781262.75	-11544.26	17.99	1.61	a
87 928	4 3 46.70	409968.44	1777070.88	-12789.90	17.20	1.00	a
87 928	644 53.04	407614.16	1785537.00	-11936.88	17.31	1.09	b
87 928	11 6 37.39	406606.28	1781223.50	-6515.06	17.19	0.99	c
87 928	1354 18.36	406844.13	1783031.13	-6541.58	16.67	0.59	b
87 928	1923 48.78	408231.94	1779478.38	-13436.49	17.33	1.10	a
87 929	029 16.97	407431.72	1780609.00	-13165.75	17.69	1.38	a
87 929	517 59.09	408444.84	1782416.00	-9567.53	17.65	1.34	c
87 929	7 7 9.82	405402.56	1786416.88	-421.12	16.74	0.65	c
87 929	7 7 54.68	413180.69	1779276.50	-12646.25	17.50	1.23	b
87 929	821 11.59	406562.31	1783946.25	-4190.93	17.13	0.95	a
87 929	11 7 39.87	406508.50	1780480.00	-12832.34	17.41	1.17	c
87 929	1134 59.32	405399.28	1788017.00	-6046.18	16.99	0.83	b
87 929	1228 38.28	398574.22	1793461.50	-8562.15	17.07	0.90	c
87 929	1242 33.91	404528.22	1787574.63	780.91	16.18	0.22	b
87 929	1437 48.58	410524.88	1776101.50	-15216.50	18.38	1.91	a
87 929	1751 31.01	409518.31	1782507.25	-10936.82	17.75	1.42	c
87 929	1812 6.64	411384.44	1777184.25	-13057.51	17.63	1.33	a
87 929	1813 16.85	393771.47	1795451.88	-16927.69	17.89	1.53	d
87 929	19 2 0.39	391406.00	1794580.00	-21253.23	18.01	1.62	c
87 929	20 7 27.93	397485.97	1791714.75	-11464.26	17.67	1.36	c
87 929	2028 56.68	396949.91	1791221.13	-15864.21	17.62	1.32	d
87 929	2039 9.22	409164.00	1784114.25	-8299.72	17.36	1.12	c
87 929	2238 52.52	406009.16	1788044.63	-3319.97	16.74	0.65	c
87 930	159 6.76	409387.41	1778535.25	-13401.90	18.35	1.88	a
87 930	159 36.94	407317.25	1781080.13	-12332.08	17.99	1.61	b
87 930	225 46.90	403601.06	1788421.13	-16444.46	17.59	1.30	a
87 930	325 57.92	407520.63	1779119.50	-12212.99	17.83	1.48	a
87 930	640 22.71	411193.50	1779399.75	-13349.13	17.02	0.86	a
87 930	8 0 36.63	397316.69	1793806.63	-1742.38	16.54	0.49	c
87 930	1024 41.95	407405.50	1780810.88	-12213.66	18.19	1.76	a
87 930	1026 37.14	407636.78	1782711.88	-9320.82	17.27	1.06	b
87 930	1047 19.66	408925.81	1776049.00	-12891.82	17.59	1.30	a
8710 1	430 14.82	396832.78	1792583.13	-12848.65	17.88	1.52	a
8710 1	732 19.67	409471.41	1776440.25	-13368.91	18.00	1.62	a
8710 1	1033 53.85	409785.38	1780791.00	-12920.29	17.84	1.49	a

8710 1	1141 55.67	404914.38	1787394.25	-1332.55	16.75	0.65	c
8710 1	12 5 47.85	410412.66	1780477.00	-13248.68	17.59	1.30	a
8710 1	1817 9.65	408740.78	1779638.25	-16419.69	18.59	2.07	c
8710 1	2043 31.81	404364.84	1786241.00	-13354.53	17.40	1.16	a
8710 1	23 7 22.78	410316.88	1778975.38	-12543.36	18.04	1.65	a
8710 2	050 5.27	405507.88	1782874.38	-7951.00	17.22	1.02	c
8710 2	130 42.01	399919.69	1796187.63	-13032.91	17.49	1.23	a
8710 2	433 27.73	410346.72	1778476.38	-13181.59	17.19	1.00	b
8710 2	714 59.23	395289.81	1795234.00	-7347.97	17.38	1.13	b
8710 3	928 34.53	412538.31	1786851.63	-16711.88	17.90	1.54	b
8710 3	10 6 22.18	397200.88	1791397.88	-14702.82	17.61	1.31	b
8710 3	1933 45.86	396060.13	1789266.38	-9038.10	17.63	1.33	b
8710 3	1935 12.98	396043.75	1790429.75	-7462.38	17.26	1.05	b
8710 4	1844 11.23	401650.31	1789887.25	-6967.05	17.64	1.34	b
8710 5	2111 52.17	397300.94	1789381.88	-4774.64	17.05	0.89	a
8710 6	137 30.17	400455.78	1798720.63	-16407.12	17.69	1.37	a
8710 6	754 16.99	395559.50	1790364.50	-6661.72	17.09	0.92	b
8710 6	935 45.12	397848.19	1789519.25	-6318.79	17.63	1.33	b
8710 6	23 6 24.54	410096.72	1790136.00	-2641.16	16.91	0.77	b
8710 7	1125 34.01	398467.94	1790685.63	-8616.33	17.21	1.01	b
8710 8	052 28.83	394214.38	1796382.38	-13322.90	17.67	1.36	a
8710 8	7 6 12.81	401315.34	1790078.38	-12706.62	17.49	1.22	c
8710 8	1612 50.21	408120.69	1796433.50	-7429.60	17.06	0.89	c
8710 9	238 7.49	397161.50	1791611.13	-19269.76	17.98	1.60	d
8710 9	642 22.73	409829.34	1789709.88	-13429.35	17.12	0.93	c
8710 9	1642 51.77	399526.97	1787689.63	-11907.79	16.85	0.73	c
8710 9	1644 4.12	399562.09	1790058.88	-7556.52	17.29	1.07	b
8710 9	1911 44.19	406348.41	1788966.13	-7650.48	16.96	0.81	b
871010	955 58.06	397352.78	1790129.63	-6507.02	17.18	0.98	a
871010	1015 50.06	403987.22	1791615.38	-9227.11	17.86	1.51	b
871010	19 7 55.19	403899.63	1787405.88	-6989.92	17.10	0.92	b
871010	2355 14.01	402490.84	1785258.50	-8540.47	17.96	1.59	c
871010	2355 44.08	404313.31	1786884.25	-8556.31	17.63	1.33	b
871011	148 36.83	395781.28	1788824.38	-8555.84	17.72	1.40	b
871011	153 47.88	396028.66	1788748.75	-7841.95	17.32	1.09	b
871011	710 57.02	396497.47	1790595.38	-6417.37	17.23	1.02	b
871012	20 6 43.97	408484.22	1794955.25	-9675.30	16.92	0.78	c
871012	2340 59.75	402858.94	1788995.63	-13343.91	18.26	1.82	b
871013	915 28.57	395043.44	1793303.50	-17437.12	17.61	1.32	c
871013	1035 56.73	402261.84	1788452.88	-13381.77	17.57	1.28	a
871013	1843 38.80	405921.59	1789591.50	-2704.10	16.75	0.66	b
871014	628 2.99	406394.66	1787203.38	-9770.16	17.27	1.06	c
871014	1329 57.51	393244.91	1787537.38	-14048.56	17.91	1.54	a
871015	10 4 50.78	398185.47	1790944.13	-13443.26	17.47	1.21	a
871016	11 9 23.84	410008.78	1781855.13	-12766.76	17.84	1.49	a
871016	1718 27.73	402747.75	1781661.50	-10235.08	18.39	1.91	c
871016	1934 31.68	408171.56	1782655.50	-33121.74	18.29	1.84	c
871017	2 0 4.68	404913.06	1784722.75	-2036.82	16.76	0.66	b
871017	534 28.04	405477.69	1785712.25	-16430.62	17.71	1.40	d
871017	814 0.51	393333.50	1797686.63	-19392.54	17.92	1.56	c
871017	844 16.55	408271.94	1779119.75	-16409.86	17.98	1.60	c
871017	1240 34.72	413911.31	1781195.88	-12355.84	18.14	1.72	a
871017	1319 11.83	409337.22	1780532.50	-13481.99	17.85	1.50	a
871017	1335 41.71	409120.03	1776701.63	-13397.34	17.70	1.39	a
871017	2322 23.69	409202.72	1778438.38	-13040.04	17.77	1.44	b
871018	013 54.41	406714.56	1780429.75	-3946.15	17.51	1.24	b
871018	250 44.97	400222.16	1789597.38	-11564.25	17.47	1.21	c
871018	435 26.55	406798.22	1781981.25	-3675.64	17.09	0.91	b
871018	546 26.40	406138.44	1781900.00	-1159.86	16.74	0.64	a
871018	7 5 40.31	407534.44	1781443.25	-2311.42	16.72	0.63	a
871018	1111 27.17	405461.28	1787211.63	-16161.24	18.36	1.89	d
871018	1725 50.54	403094.50	1787789.88	-18056.95	17.62	1.32	a
871019	212 31.09	411590.81	1777398.50	-25768.23	17.88	1.53	c
871019	738 26.82	410774.53	1777907.25	-6059.57	17.38	1.14	a
871019	9 6 42.41	406364.16	1787264.63	-6189.71	17.18	0.99	b
871019	1048 45.03	398804.88	1791595.38	-10549.73	17.37	1.13	c

871019	1053 59.12	408597.72	1778248.75	-1143.41	16.72	0.63	a
871019	12 8 15.87	396995.50	1792741.38	-13332.16	18.05	1.66	c
871019	15 7 17.81	398665.44	1778461.00	-64637.38	19.24	2.57	c
871019	1818 21.32	396294.41	1790380.50	-12783.98	17.86	1.51	b
871019	2235 11.85	401673.28	1794093.13	-19319.00	18.29	1.84	d
871020	655 38.37	404779.19	1782604.38	-19072.07	18.00	1.62	a
871020	1054 17.55	411085.22	1781404.00	-36640.30	18.27	1.83	c
871020	1611 44.65	399351.78	1794202.50	5110.76	16.69	0.61	a
871020	17 3 40.44	399925.25	1792145.25	-5349.91	17.40	1.15	c
871020	1938 54.76	394944.69	1792301.38	-15817.54	18.02	1.63	a
871020	2056 4.21	409310.00	1776138.13	-21467.62	18.05	1.65	c
871020	23 8 42.86	398600.13	1795486.25	-1083.55	17.18	0.99	c
871021	333 35.61	411096.03	1778459.00	-29967.22	18.24	1.80	c
871021	522 11.63	409263.09	1784183.75	-3589.53	17.27	1.06	c
871021	1454 6.44	398950.22	1794345.88	6633.33	16.76	0.66	b
871021	17 0 49.70	399999.75	1785772.63	-17428.59	17.96	1.59	d
871021	2157 27.22	409494.69	1789492.63	-39686.23	18.66	2.12	c
871022	731 19.74	406352.34	1784902.75	-1754.57	16.87	0.75	b
871022	1235 11.77	401633.59	1788245.63	-13133.93	17.55	1.27	a
871022	1326 56.96	404712.94	1791003.25	-13394.96	18.21	1.78	a
871022	19 2 34.91	408064.59	1788282.75	-13458.92	17.50	1.23	a
871022	2252 42.46	409866.09	1779436.75	-18169.83	18.54	2.03	d
871023	135 8.21	408231.56	1782827.63	-39783.87	18.09	1.68	c
871023	842 34.76	407579.03	1778983.00	-12836.47	18.05	1.65	c
871023	920 37.56	404088.59	1786544.00	-1713.90	16.95	0.81	b
871023	1020 33.09	407159.75	1784066.00	-8703.82	17.38	1.14	c
871023	1325 46.25	407040.97	1786064.00	-6384.80	17.42	1.17	c
871024	239 47.74	401091.94	1788502.00	-12839.03	18.61	2.09	a
871024	543 23.22	405522.31	1785959.75	-6659.13	17.61	1.32	c
871024	621 1.49	404929.13	1785905.38	-3143.15	17.22	1.01	c
871024	631 10.84	405777.56	1784906.38	-12290.10	17.75	1.43	d
871024	1112 36.31	406524.59	1785443.50	-7753.54	16.97	0.82	b
871024	1148 15.22	397955.81	1787575.50	-23854.83	18.82	2.24	d
871024	1150 33.86	398963.66	1790498.88	-13147.73	18.09	1.68	a
871024	1420 8.88	404388.47	1784351.75	-11289.57	18.61	2.08	b
871024	2014 46.95	405097.78	1779710.63	-28008.89	18.64	2.10	c
871024	2039 48.13	402993.47	1795905.38	-12660.66	18.01	1.62	d
871024	21 9 49.09	397527.31	1786106.25	-24794.40	19.04	2.42	a
871025	248 10.54	406623.03	1786397.25	-4324.34	16.96	0.81	c
871025	358 42.43	405560.38	1783249.38	-8858.70	17.69	1.38	c
871025	612 51.29	407724.38	1786289.13	-5979.02	18.44	1.95	c
871025	7 7 42.39	405192.59	1785352.38	-4129.36	16.86	0.74	c
871025	725 36.99	405679.47	1782961.00	-9475.91	17.63	1.33	c
871025	952 28.42	407515.06	1787026.63	-5487.46	16.87	0.75	d
871025	1013 41.01	407023.94	1786133.50	1273.22	16.52	0.48	b
871025	1028 34.99	405040.69	1787657.13	-7177.79	17.61	1.32	c
871025	1046 59.80	409266.38	1781816.63	-13194.09	18.55	2.04	c
871025	12 9 0.04	406184.72	1790017.00	-9328.80	17.49	1.22	a
871025	1238 38.32	402696.22	1782160.88	-9164.53	18.57	2.05	b
871025	1453 28.28	406392.38	1789736.13	-7181.49	17.31	1.08	a
871025	1517 31.15	405775.25	1790155.75	-7769.32	17.31	1.09	a
871025	16 0 15.85	406893.03	1782526.50	-10708.91	17.84	1.49	b
871025	1728 38.90	406100.38	1783293.63	-11885.80	17.96	1.58	d
871025	1813 32.93	400521.69	1790629.75	-27838.42	19.77	2.97	d
871025	1816 45.18	406330.38	1781929.75	-23648.34	18.66	2.13	b
871025	21 5 25.39	405032.47	1786147.38	-4771.03	16.83	0.72	c
871025	2314 23.54	402053.84	1794720.38	-8996.98	17.52	1.25	c
871026	226 9.54	407139.75	1786896.00	-5362.68	17.04	0.88	c
871026	458 45.81	405978.97	1780430.13	-12841.33	17.81	1.47	c
871026	537 56.44	407097.41	1785958.88	-4134.81	17.32	1.09	b
871026	654 47.17	406796.59	1784806.50	-6714.03	17.70	1.39	c
871026	1421 2.54	406728.66	1785829.88	-3231.10	17.09	0.92	c
871026	1437 39.30	405655.84	1788750.88	-8821.29	17.39	1.15	d
871027	9 5 2.76	406564.63	1782910.38	-13251.19	18.03	1.64	a
871027	11 5 12.50	405489.16	1786053.25	-4214.30	16.71	0.62	c
871028	113 52.31	404953.72	1785553.38	-5579.70	17.60	1.31	c

871028	346	8.51	404301.84	1786923.25	-3250.16	17.39	1.15	a
871028	350	14.87	406676.47	1787409.63	-13407.82	18.11	1.70	a
871028	9 6	14.76	403784.47	1784386.75	-13241.36	18.40	1.92	b
871028	1055	47.51	405554.78	1785454.25	-2597.14	17.24	1.03	b
871028	1219	0.34	405879.25	1787512.00	-5808.59	17.38	1.14	c
871028	1227	46.68	410211.91	1782912.75	-13389.78	18.02	1.63	c
871028	1330	1.89	406893.66	1780749.75	-10667.67	18.09	1.69	c
871030	2315	29.45	405494.09	1785800.50	-3545.00	17.23	1.02	c
871031	149	54.57	398824.88	1784321.13	-33777.87	19.24	2.57	c
871031	229	48.94	404818.91	1788531.00	-11752.55	17.59	1.30	c
871031	451	50.31	404657.50	1785694.75	-4907.39	17.34	1.11	b
871031	9 1	45.77	402470.19	1788331.38	-13091.64	18.10	1.69	a
871031	917	34.12	406753.25	1784429.88	-8913.65	17.74	1.42	c
871031	1158	25.99	407331.34	1778972.13	-3548.90	16.96	0.81	b
8711 5	4 2	50.51	406595.47	1786294.25	-5144.34	17.36	1.12	d
8711 5	6 3	1.38	403495.75	1781822.88	-7559.50	17.65	1.35	b
8711 5	623	43.98	403870.75	1784283.00	-8850.60	18.02	1.63	b
8711 5	624	29.99	404110.59	1789182.63	-547.44	16.95	0.80	b
8711 5	916	22.26	404776.59	1785557.75	-6637.78	17.16	0.97	c
8711 5	946	21.72	406494.41	1788352.63	-3697.16	16.59	0.53	b
8711 5	2048	13.22	408116.44	1783422.00	-6864.22	17.95	1.58	c
8711 5	2139	54.05	397971.53	1787143.75	-25501.27	19.26	2.58	d
8711 5	2226	0.06	406951.75	1784093.38	-9859.95	17.72	1.40	c
8711 5	2227	24.35	407220.13	1786405.88	-6426.86	16.98	0.83	c
8711 6	216	5.37	404650.25	1785643.25	-3914.83	17.35	1.11	b
8711 6	4 8	10.90	405936.34	1792868.75	-16588.92	17.72	1.40	a
8711 6	6 2	12.81	405815.28	1784107.00	-2738.67	16.95	0.81	a
8711 6	614	38.00	408382.19	1782499.13	-9532.51	17.43	1.17	c
8711 6	9 2	44.46	406950.13	1785053.25	-4145.22	17.17	0.98	c
8711 6	11 3	14.34	404882.88	1786563.25	-4938.18	17.34	1.11	b
8711 6	1138	5.88	404998.38	1786277.50	-11939.26	17.53	1.26	d
8711 6	1231	44.18	405845.16	1791980.88	-7889.14	17.18	0.99	a
8711 6	1351	48.79	408100.38	1782355.75	-13309.88	18.85	2.27	a
8711 6	1357	37.40	405766.41	1805013.13	18136.59	16.04	0.11	a
8711 6	1519	30.72	404968.81	1785580.63	1083.25	16.83	0.72	a
8711 6	1547	31.10	405304.13	1783800.25	-7564.99	17.74	1.41	c
8711 6	1753	33.41	405079.06	1784506.88	-4469.33	17.01	0.86	c
8711 7	1 1	11.98	410543.91	1785115.88	-9658.67	18.24	1.80	c
8711 7	415	46.08	408125.63	1784612.88	-9608.53	18.17	1.75	c
8711 7	427	5.45	406128.59	1787253.50	-4422.01	17.04	0.88	b
8711 7	1320	45.70	406783.75	1786791.75	-2583.37	16.92	0.78	b
8711 7	1356	47.14	406191.25	1784207.00	-8462.64	17.69	1.38	c
8711 7	1443	1.12	406721.75	1783979.25	-8939.64	17.91	1.55	c
8711 7	1517	1.80	406835.28	1778190.63	-5972.86	17.10	0.92	a
8711 7	1616	37.19	407703.72	1784249.38	-7904.84	17.74	1.41	c
8711 7	1719	36.61	405986.88	1786765.13	-2149.28	17.40	1.15	b
8711 7	1732	33.86	409408.09	1778345.25	-7678.81	17.44	1.19	c
8711 7	1920	52.30	406630.88	1786016.00	-6750.35	16.98	0.83	b
8711 7	21 4	10.51	406837.59	1788056.50	-22002.31	17.92	1.55	c
8711 7	22 8	36.21	405889.09	1782249.75	-3585.59	16.92	0.78	b
8711 7	2315	7.80	402818.28	1790707.50	6588.88	17.60	1.31	c
8711 7	2317	1.80	409882.50	1782842.13	-13026.84	18.78	2.21	b
8711 8	010	35.10	406369.09	1782306.88	-5150.17	16.63	0.56	a
8711 8	011	17.15	405864.16	1782640.88	-4857.57	16.73	0.64	b
8711 8	255	45.99	406365.16	1782629.63	-8645.57	17.12	0.94	b
8711 8	3 0	5.87	408542.94	1778741.13	-9371.17	18.42	1.94	b
8711 8	3 1	6.24	406769.34	1782990.13	-6942.99	18.41	1.93	c
8711 8	341	24.96	398524.03	1790586.13	-9910.37	17.55	1.27	c
8711 8	430	38.65	407425.81	1788287.38	-3317.50	16.85	0.73	b
8711 8	439	22.33	397680.53	1792747.00	-4240.49	16.78	0.67	b
8711 8	749	48.04	407456.97	1783249.38	-10254.78	18.50	2.00	c
8711 8	1045	44.08	399684.78	1790174.38	-8300.76	17.46	1.20	b
8711 8	11 3	53.18	399037.47	1791339.88	-7308.46	17.35	1.11	c
8711 8	1452	29.68	406790.66	1779673.88	-13454.46	17.32	1.09	b
8711 8	1514	1.67	407053.47	1787888.63	-2903.46	16.87	0.75	b
8711 8	1544	24.70	406486.19	1788695.38	-2307.48	17.11	0.93	b

8711 8	1854 20.97	407557.06	1781015.13	-7322.12	17.12	0.94	b
8711 8	2036 5.39	404670.94	1786964.50	-4040.89	17.33	1.10	a
8711 9	325 38.30	407861.53	1792044.88	3745.55	16.25	0.27	b
8711 9	840 0.30	407755.88	1785683.38	-6576.13	17.51	1.23	c
8711 9	1519 54.52	406888.13	1788806.75	-2987.70	16.79	0.69	b
8711 9	21 2 42.90	407925.84	1788370.38	-261.73	16.53	0.49	b
8711 9	2115 29.05	406473.41	1787127.50	-9591.68	17.30	1.08	b
8711 9	2130 9.72	404334.31	1784914.38	-13122.68	17.47	1.21	c
8711 9	22 8 26.25	401030.91	1784538.75	-56999.67	18.68	2.14	c
8711 9	23 9 52.14	405128.28	1784604.63	-8514.02	17.64	1.34	c
871110	018 31.82	407750.28	1788321.75	-905.63	16.58	0.52	c
871110	826 0.90	406126.97	1779889.88	-10117.46	17.78	1.45	c

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