Anatomy of Earthquake Swarms in the San Acacia, New Mexico Area

[June 1982 through May 1988]

By

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INTRODUCTION

The study area (Figures 1 & 2) is in the Socorro, New Mexico area of the Rio Grande rift. Surrounding San Acacia, the area (34.2°N to 34.4°N by 106.75°W to 106.95°W) is one of the most geophysically active areas of the rift. While a large area around Socorro is being uplifted and deformed by the inflation of a mid–crustal magma body, the apex of the uplift and the greatest rate of deformation (Figures 3 and 4) are in the San Acacia area (Larson and Reilinger, 1983; Sanford, 1983). A travel time inversion for an upper crustal velocity structure around Socorro (Figure 5) shows the San Acacia area to have an anonamously low P–wave velocity (Ward,1980). This could indicate the presence of magma in the upper crust.
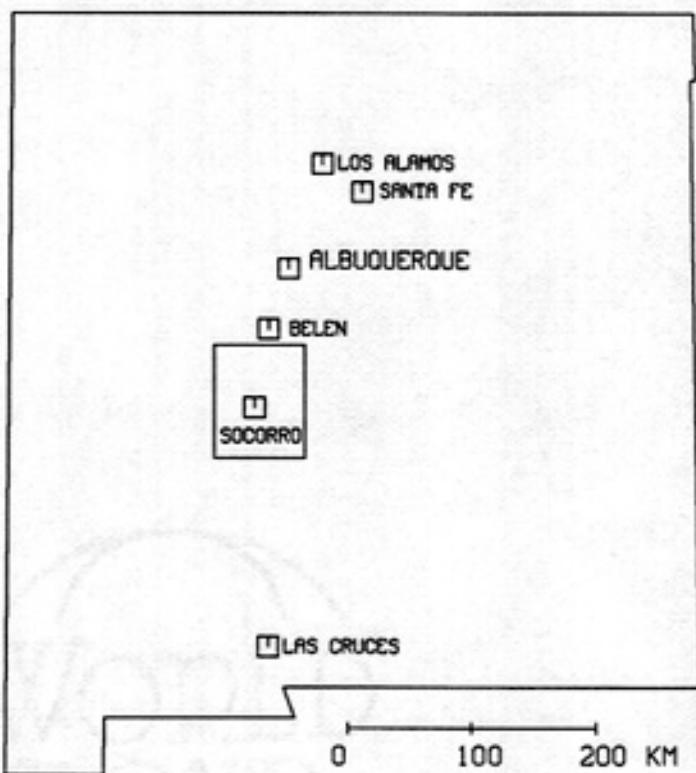

Figure 1.   Map of New Mexico showing Socorro area.

A large swarm of earthquakes occurred in the area in February and March of 1983. Jarpe (1984) studied this swarm and found earthquakes with unusual fault plane
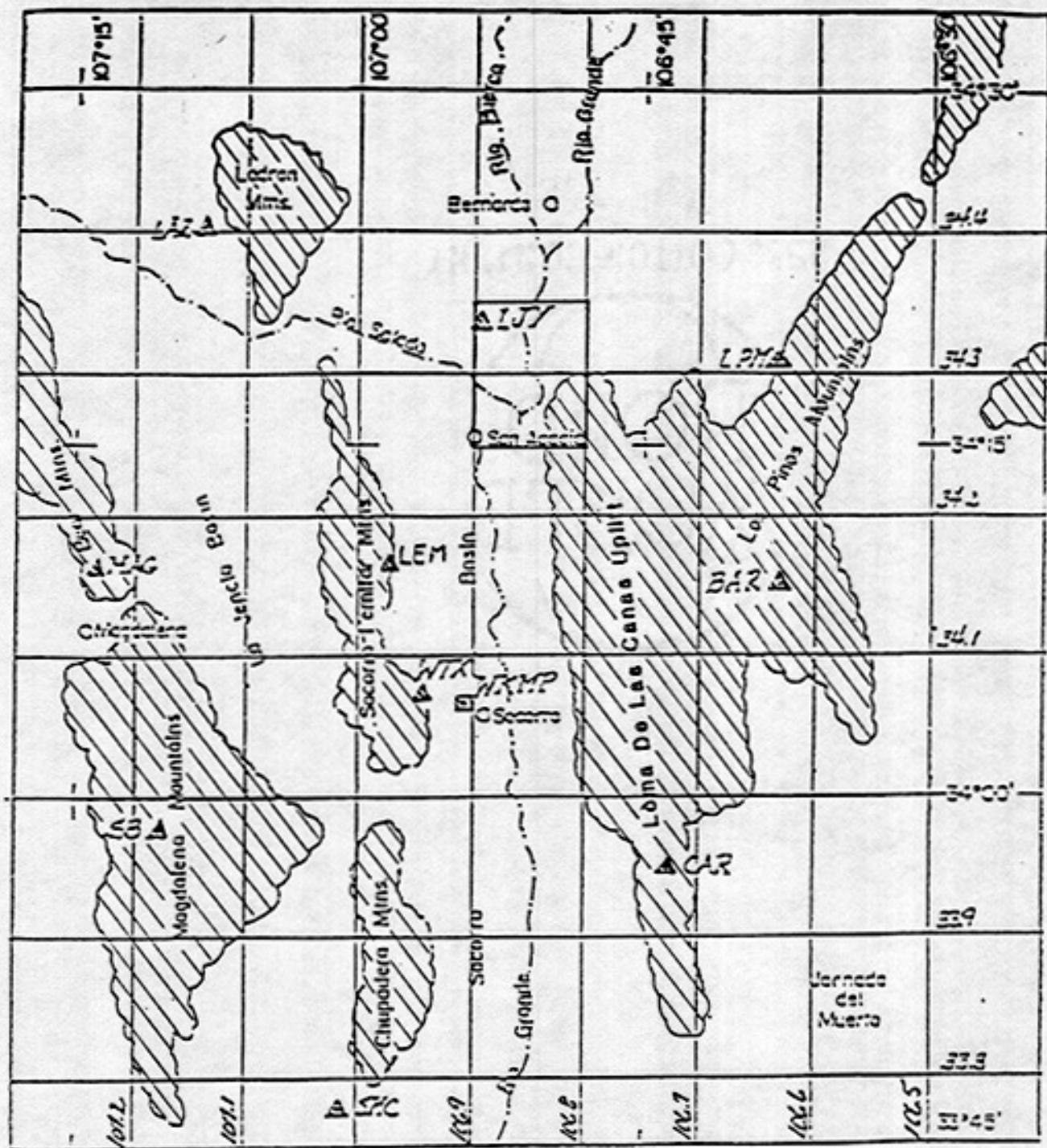
Figure 2. Map of Socorro area with San Acacia study area indicated with dark border. Triangles represent the NMIMT seismograph stations most in operation. Mountains are indicated with hatched pattern.
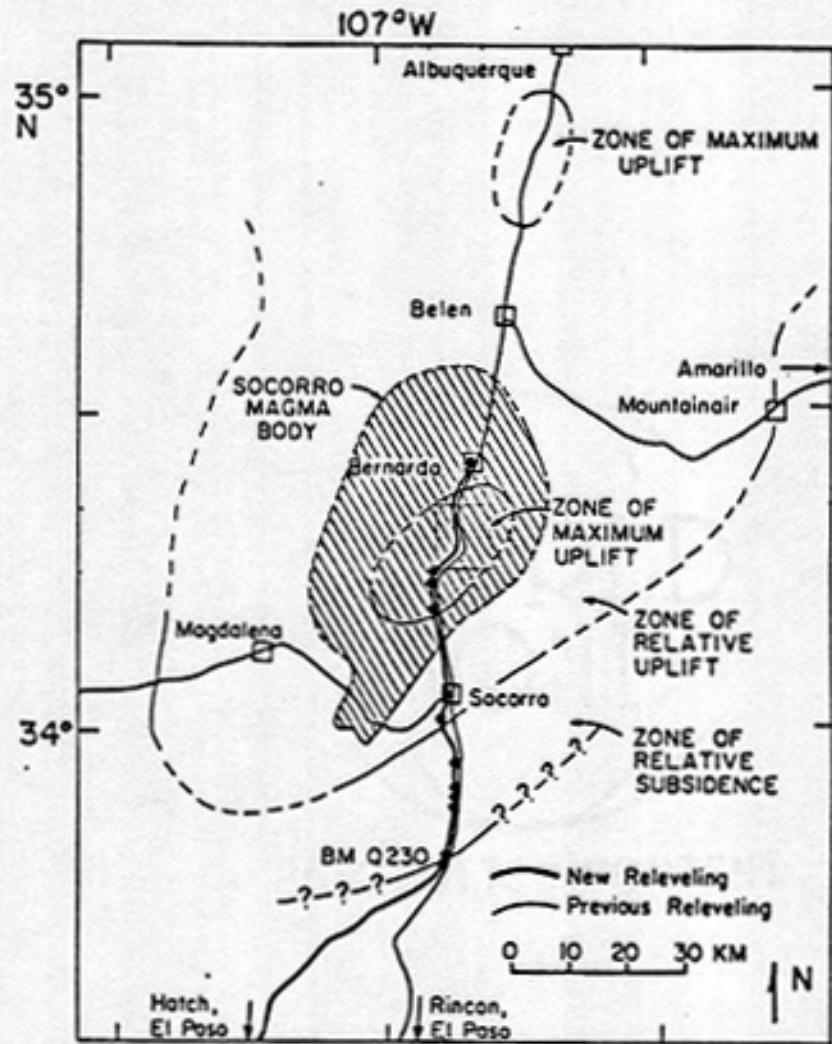
Figure 3. Location of study area, indicated with dark border, within zone of maximum uplift. Extent of Socorro magma body is shown with hatched pattern (after Larsen and Reilinger, 1983).
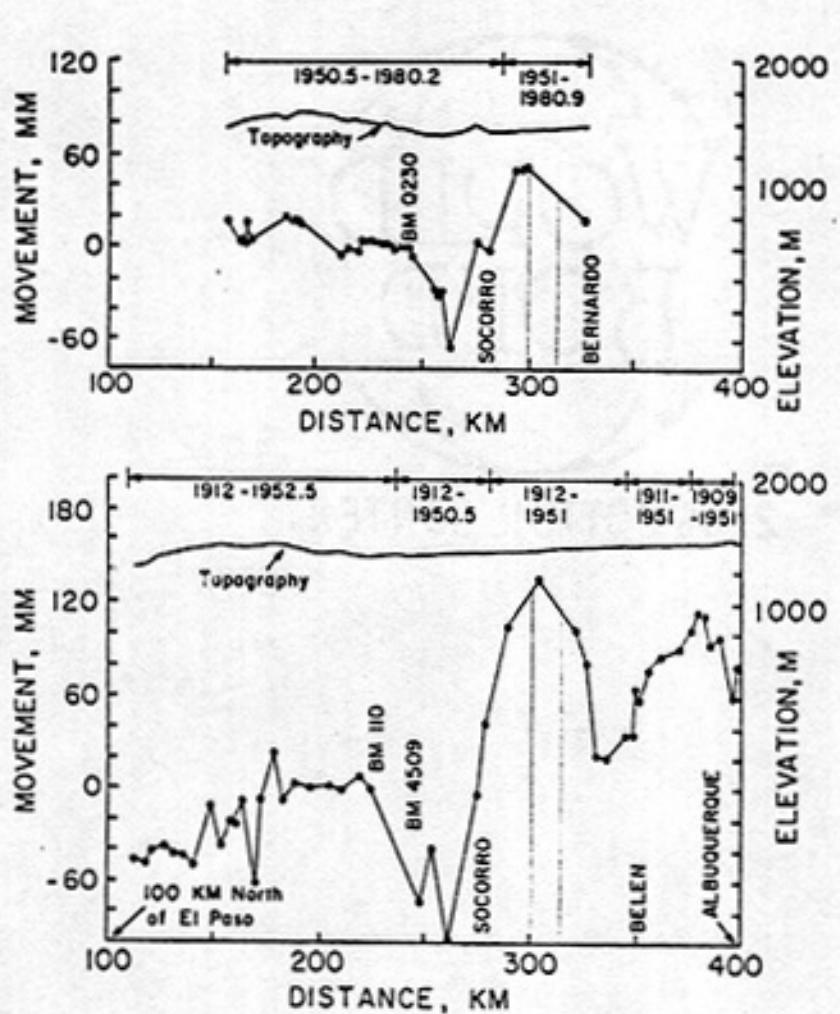
Figure 4. Elevation-change profiles and topography along the north-south leveling routes shown in Figure 3. Distances (km) are measured from El Paso, Texas. The location of the study area is indicated by the light vertical lines (after Larsen and Reilinger , 1983).

Figure 5.   Location of study area in Ward (1980) P-wave velocity inversion (from Jarpe (1984)).

Ward's (1980) thirty-six block velocity model
obtained from the damped least-squares inversion of
travel-time data. The velocities and their un-
certainties (one s.d.) are given.

Ward's (1980) forty-eight block velocity model
calculated using a generalized least-squares inversion
of travel-times. Also given along with the velocities
in km/sec are their one s.d. uncertainties and the
diagonal elements of the corresponding resolving
kernels. Also see Ward and others (1981).

solutions. This study is an expansion of Jarpe's study in that it looks at six years (June, 1982 through May, 1988) of recorded earthquakes in the San Acacia area.

HISTORICAL SEISMICITY

The Socorro area has historically been the most seismically active area in the state (Figure 6). Instrumental monitoring by the New Mexico Institute of Mining and Technology and the USGS since 1975 has shown that the greatest concentration of seismic activity over time has occurred in the San Acacia area (Figures 7,8, and 9). Several "felt" earthquakes have occurred in the area (Sanford et al., 1983).
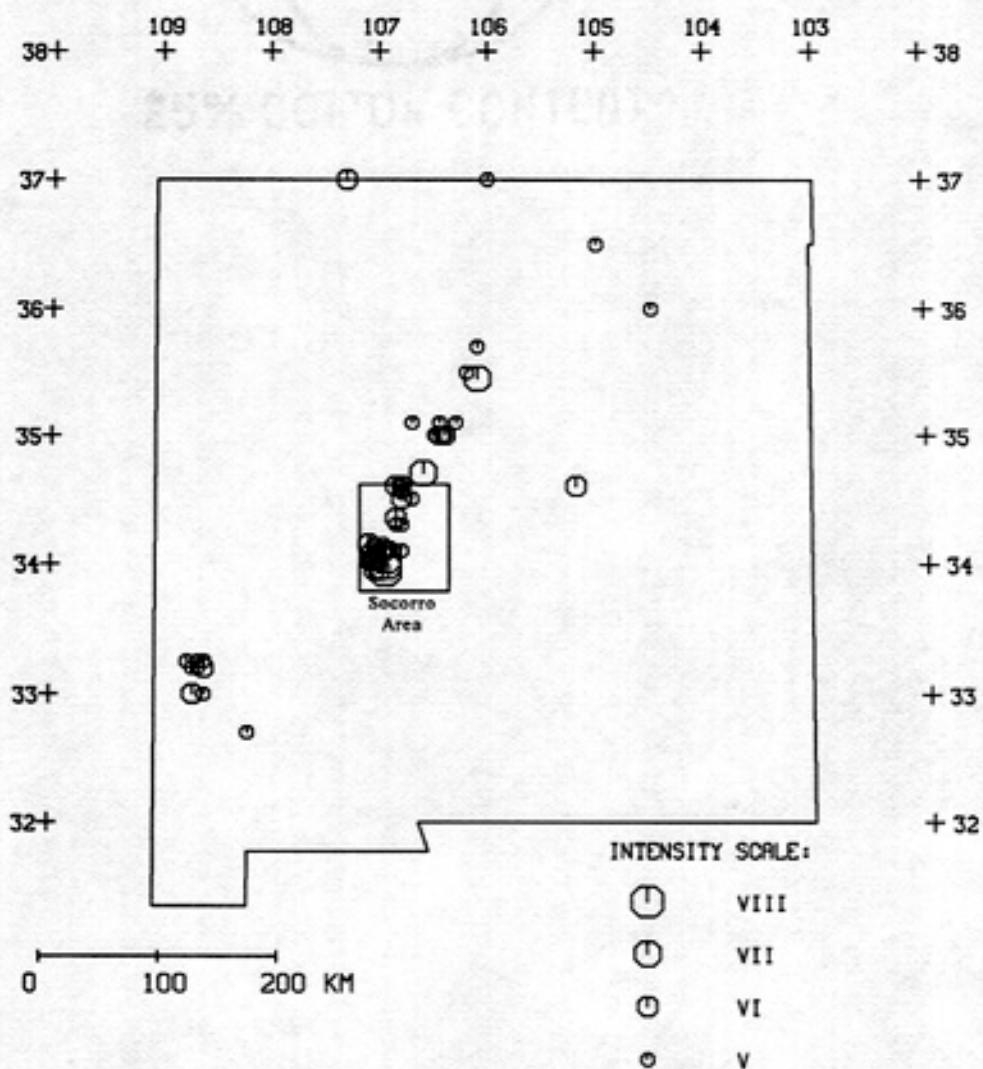
Figure 6. Map of the historical seismicity of New Mexico (1868 – 1962).

THE FIRST EVENT IS ON
JUNE 3 , 1975

THE LAST EVENT IS ON
JANUARY 17, 1978

220 EVENTS WERE PLOTTED
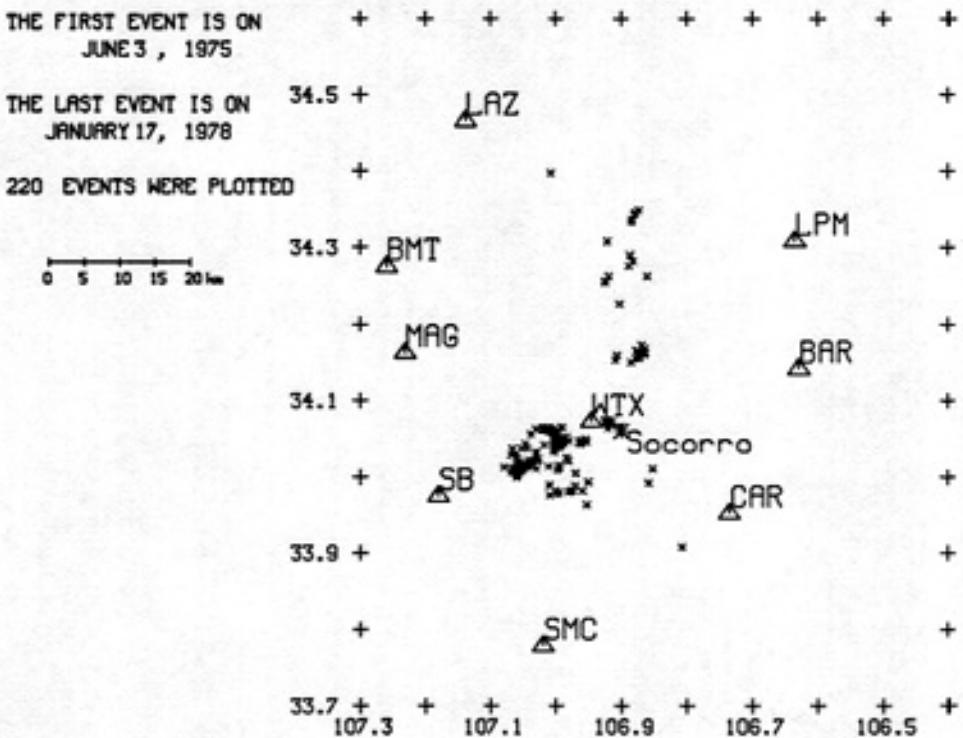
Figure 7.   Map of local seismicity 1975 through 1978.

THE FIRST EVENT IS ON
JUNE 4 , 1982

THE LAST EVENT IS ON
MAY 31, 1988

1586 EVENTS WERE PLOTTED
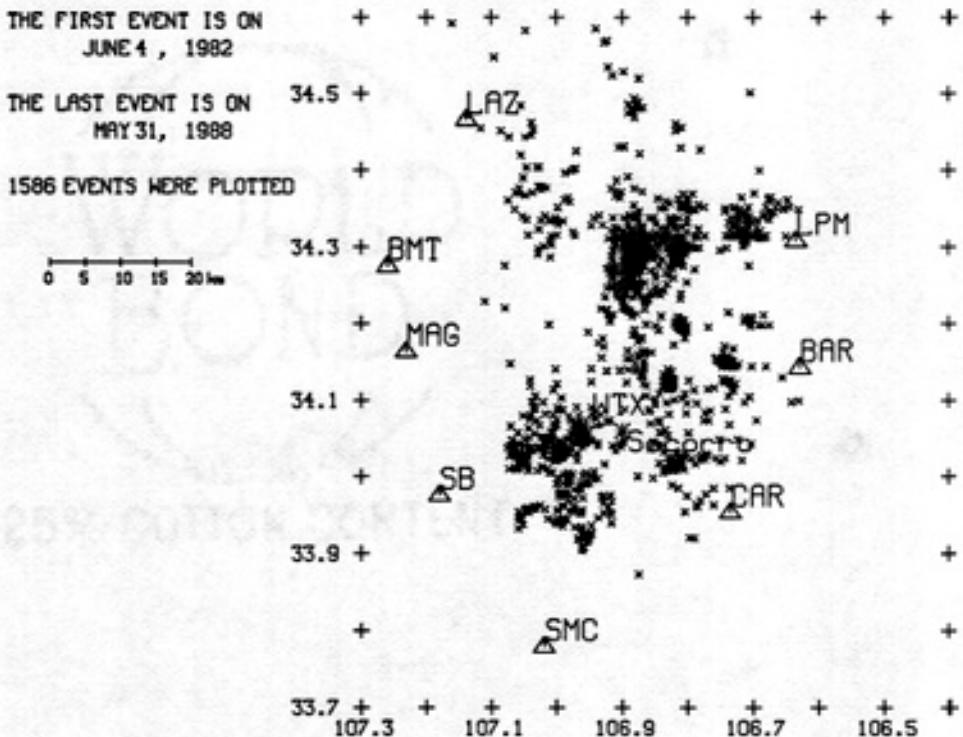
Figure 8.   Map of local seismicity 1982 through 1988.
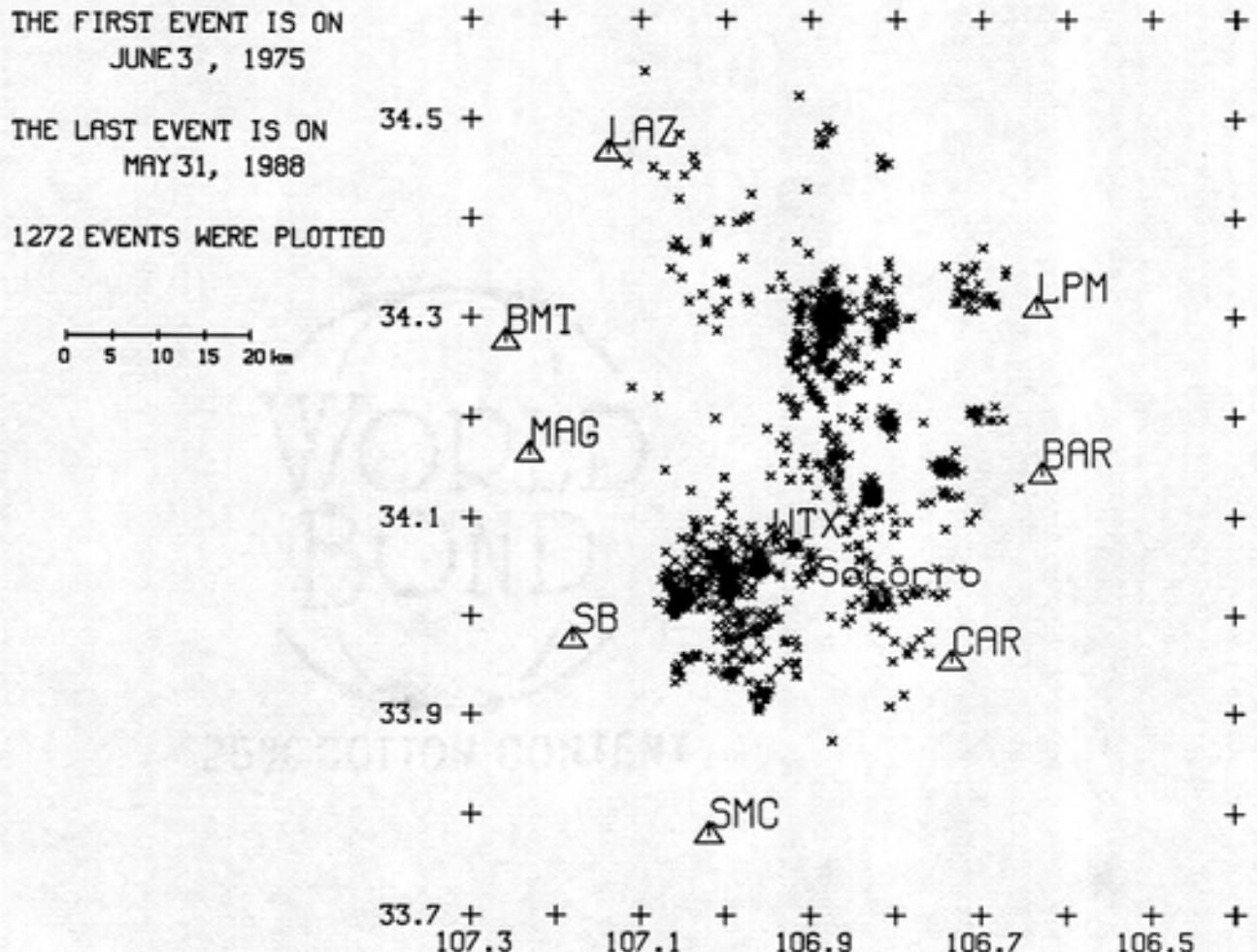
Figure 9.   Map of local HYPO71 B quality or better hypocenters (1975 through 1988).

RECENT FAULTING

Machette (1987) has mapped several N–S trending faults in, or nearby, the San Acacia area with Early to Late Pliestocene movements (Figure 10). The offsets along these faults range from 6 m on the Cliff fault to over 150 m of displacement on the La Joya Fault.
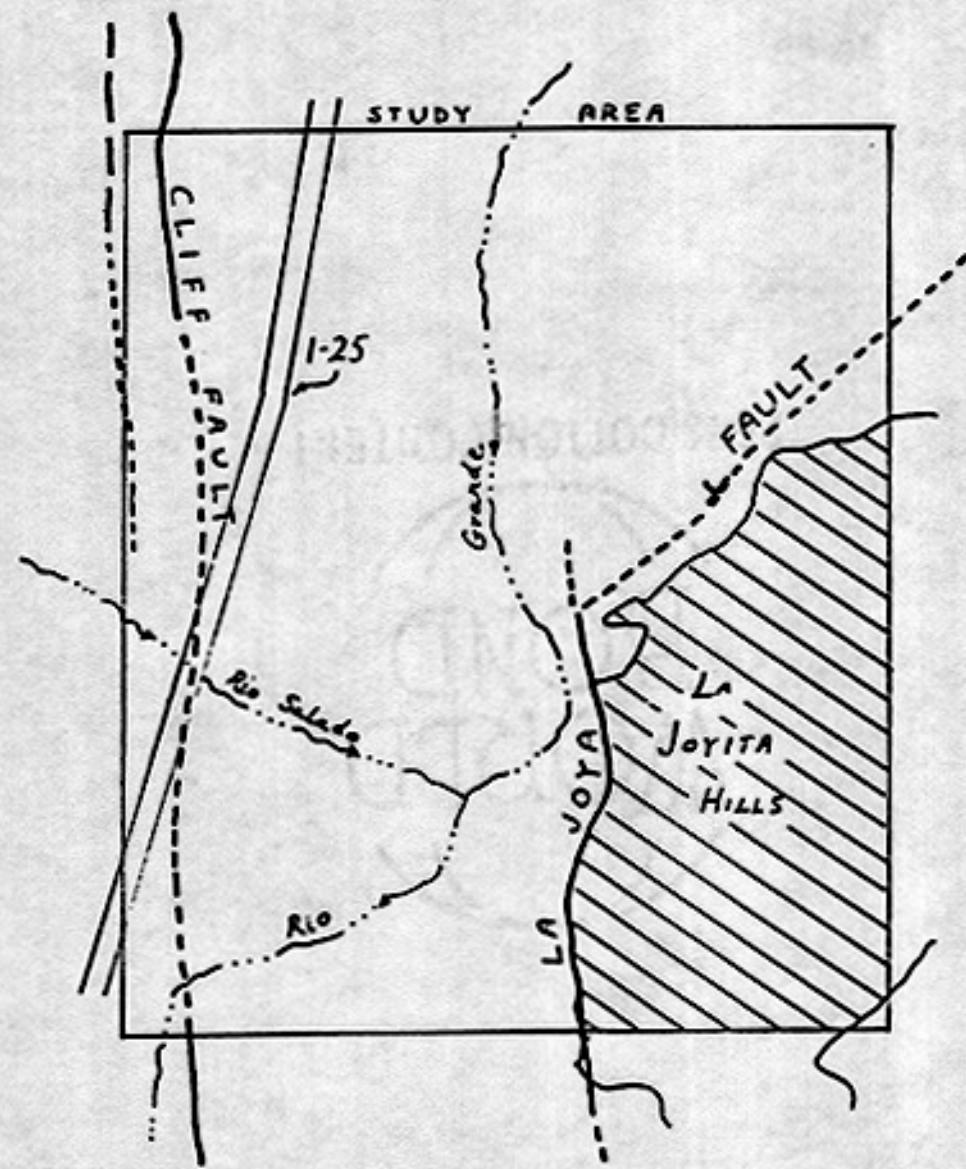
Figure 10.   Recent faulting in the study area (after Machette, 1986, 1987). There is 6 m of offset along the Cliff fault and the last movement was in the Late Pleistocene. The La Joya fault has over 150 m of displacement with the last movement ocurring in the Early Pleistocene to Pliocene. The northeast trending fault had Late to Middle Pleistocene movement.

DATA AQUISITION AND ANALYSIS

The seismograms used to locate the earthquakes and determine first motion information for this study were recorded on analog short-period instruments primarily from permanent seismograph stations. Some seismograms from temporary stations set out during the 1983 swarm were also used.

Figure 11 shows the locations of these seismograph stations relative to the study area. Table 1 contains the locations and elevations of the permanent and temporary station sites used during the study period.
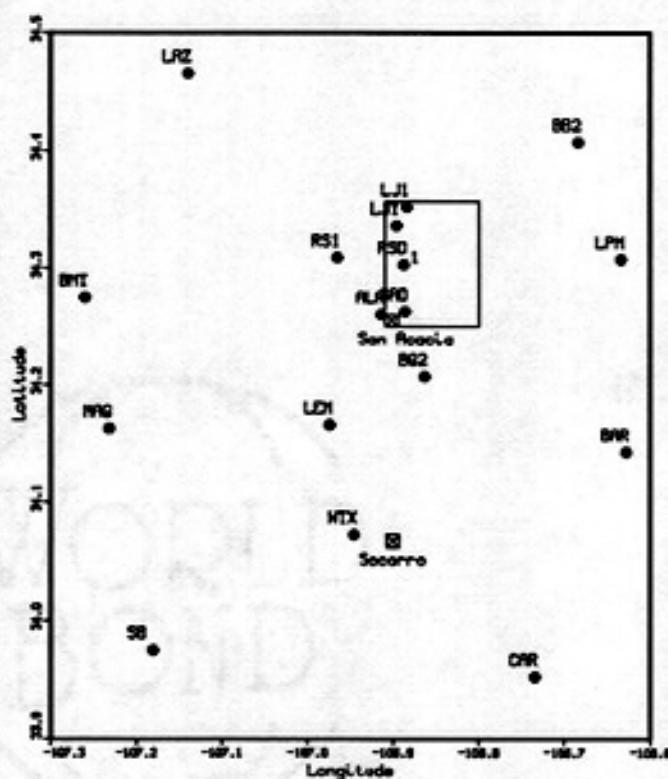
Figure 11. Map showing seismogragh stations and study area.

EARTHQUAKE LOCATION PROCEDURE

The earthquake hypocenters used in this study were computed using the HYPO71 (Revised) location program (Lee and Lahr, 1975). The crustal model was a homogeneous half-space with a P-wave velocity of 5.85 km/s and a Poisson's ratio of

0.25. This model has been in use at NMIMT for many years and has been justified by Rinehart (1979) and Ward (1980). Station corrections were computed from the A quality events using the reiterative method of Jarpe (1984) and were found to be consistent with those computed by Jarpe and those presently used by NMIMT. Therefore, the original locations were used.

TABLE 1

Station	Latitude	Longitude	Elevation	This Study	Jarpe	NMIMT
		Permanent Stations		Station Corrections		
ALQ	3456.50	10627.50	1853			−0.13
BAR	3408.52	10637.68	2120	−0.11	0.00	−0.03
BMT	3416.50	10715.61		0.15	0.01	0.14
CAR	3357.15	10644.07		0.07	0.12	0.03
LAZ	3424.12	10708.36		−0.02	−0.07	0.04
LEM	3409.93	10658.45	1698	0.03		0.06
LJY	3420.19	10653.75		0.45		0.56
LPM	3418.77	10638.03		−0.15	−0.06	−0.23
MAG	3409.75	10713.92		0.09		0.08
MLM	3448.85	10708.70	2088		−0.10	−0.10
SB	3358.51	10710.84	3230	0.16		0.22
SMC	3346.72	10701.16	1560	0.15	0.15	0.11
SNM	3404.21	10656.61	1511			−0.04
WTX	3404.33	10656.75	1555	0.01	−0.04	−0.08
		Temporary Stations		Station Corrections		
ALA	3415.61	10654.80		0.18	0.14	
BB2	3424.42	10641.02		0.10	0.13	
BG2	3412.41	10651.79			0.05	
LJ1	3421.14	10653.02		0.11	0.11	
LJ2	3423.02	10653.63			0.64	
RS1	3418.55	10657.90		−0.28	0.06	
RS2	3419.13	10658.70			0.01	
RSD	3418.19	10653.23		−0.32	−0.25	
SAD	3415.77	10653.15		−0.10	−0.10	
SAH	3415.00	10654.33				

MAGNITUDE CALCULATION

The magnitudes for the events were computed from the Los Alamos National Laboratory duration magnitude formula (Newton et al., 1976):

$$M_D = 2.79 \log(\text{duration}) - 3.63 \ .$$

Ake et al. (1983) found this relationship to be applicable to the Socorro area for earthquakes with magnitude greater than 1.0 . However, the strength of earthquakes with magnitudes smaller than 1.0 tends to be underestimated.

SOLUTION QUALITY

Criterian used in computing quality ratings for the hypocenters are listed in Table 2. A "precise" solution for this study was taken to be a solution with ERH $\leq$ 0.5 km. and ERZ $\leq$ 1.0 km.

TABLE 2

B   Solution quality of the hypocenter. This measure is intended to indicate the general reliability of the solution:

Q	Epicenter	Focal Depth
A	Excellent	good
B	good	fair
C	fair	poor
D	poor	poor

Q is taken as the average of QS and QD (defined below). For example, an A and a C yeild a B, and two B's yeild a B. When QS and QD are only one level apart, the lower one is used, i.e., an A and a B yeild a B.

A\B   QS and QD rating. In this case, QS = A, and QD = B.
QS is rated by the statistical measure of the solution as follows:

QS	RMS (sec)	ERH (km)	ERZ (km)
A	< 0.15	$\leq$ 1.0	$\leq$ 2.0
B	< 0.30	$\leq$ 2.5	$\leq$ 5.0
C	< 0.50	$\leq$ 5.0	
D	Others		

QD is rated acording to the station distribution as follows:

QD	NO	GAP	DMIN
A	$\geq$ 6	$\leq$ 90°	$\leq$ DEPTH or 5km
B	$\geq$ 6	$\leq$ 135°	$\leq$ 2x DEPTH or 10 km
C	$\geq$ 6	$\leq$ 180°	$\leq$ 50km
D	Others		

RESULTS

Seismic Activity

During the study period (June, 1982 through May, 1988) there were 556 located events in the San Acacia area. Appendix A contains the hypocenter information for these events. A breakdown of origin times into hours of the day (Figure 12) shows a slightly
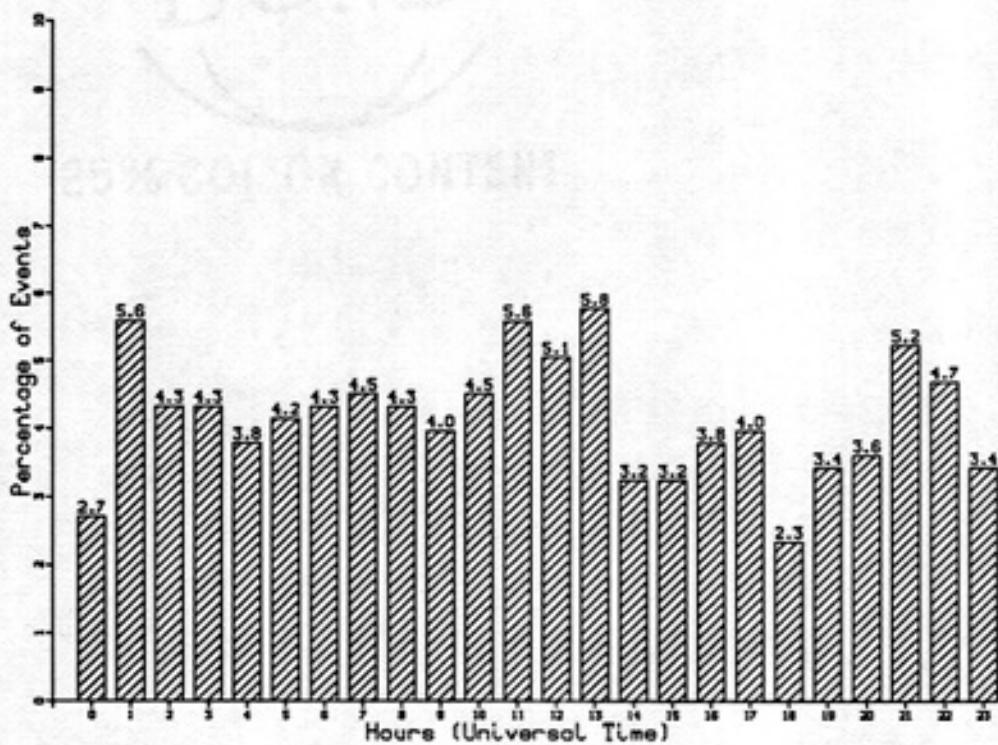
Figure 12. Chart showing the distribution of events through the day.

lower occurrence rate during the local daylight hours. There are two reasons for this. First, cultural noise levels increase during the daylight hours making location of very small events more difficult. Second, the seismograph sensitivity is sometimes turned down during the day because of the increase in noise.

Figure 13 shows the number of events that occurred per month during the study period. For most of the time there is an almost constant level of monthly activity, but most of the events occur in swarms such as the large swarm in March, 1983.
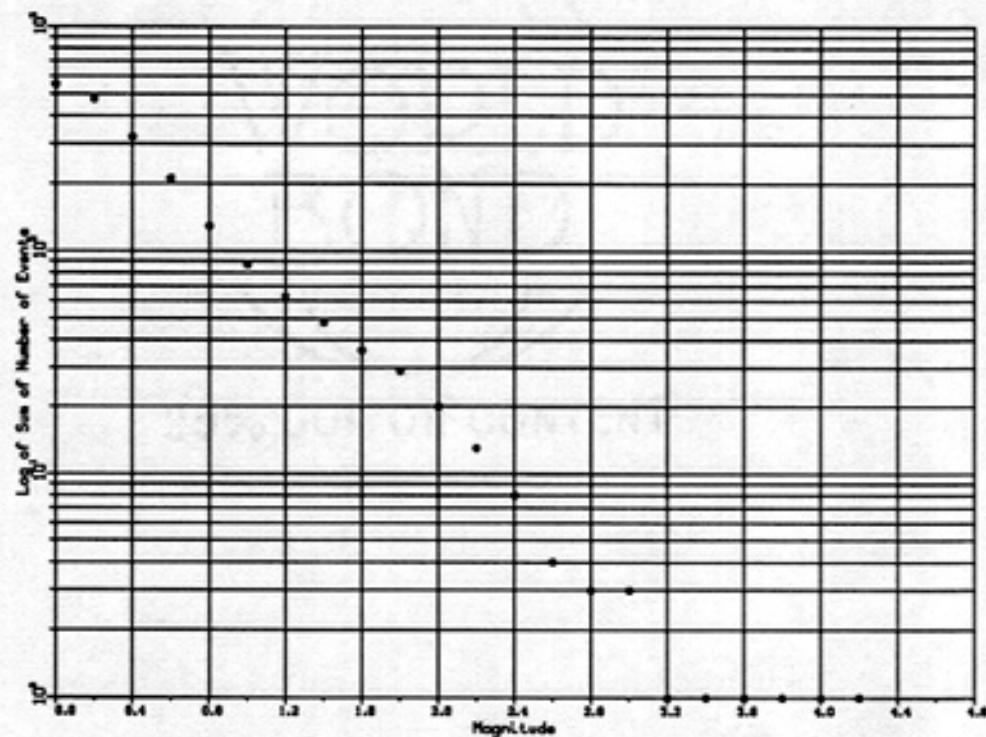
Figure 14.   A log sum N vs. magnitude plot for all events in study area 06/82 to 06/88.
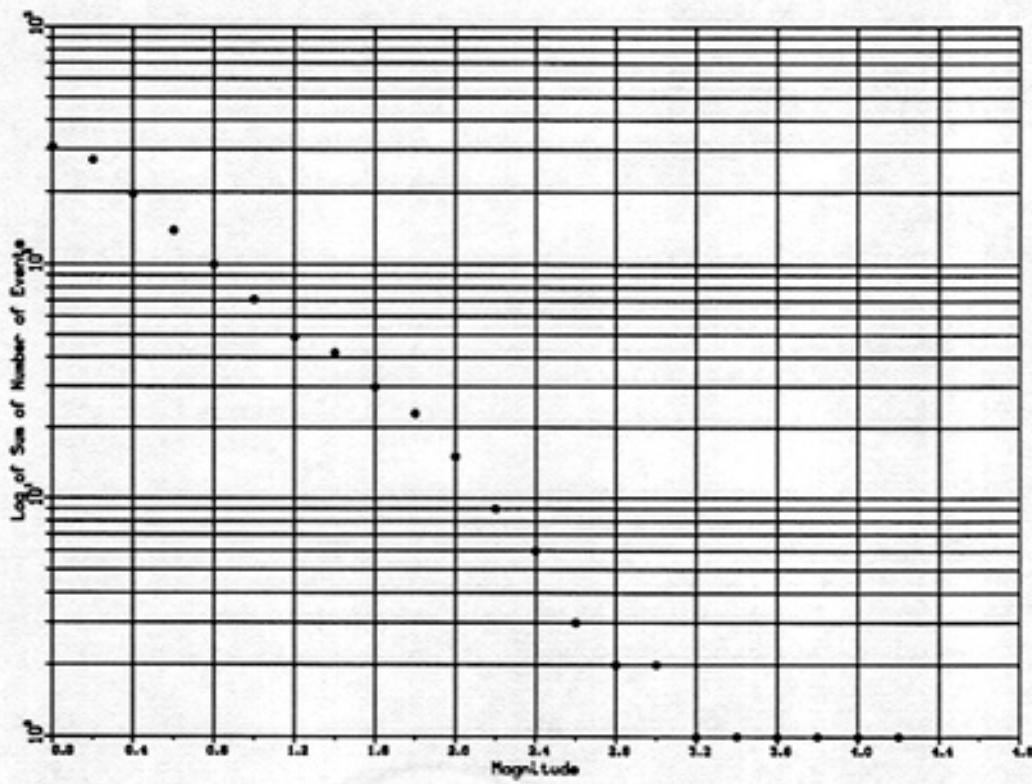
Figure 15.   A log sum N vs. magnitude plot for those events detected at five stations or more.
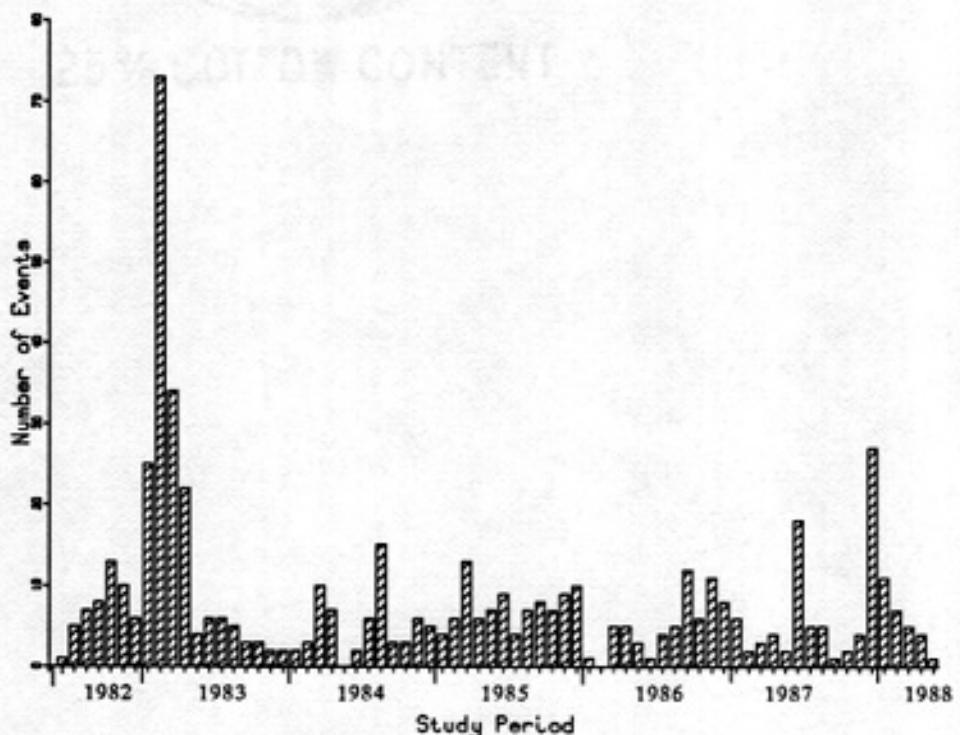
Figure 13.   Events per month during the study period.

Plots of the log sum of the number of events versus their magnitude for the whole data set (Figure 14) gives the relationship

$$\log \Sigma N = 2.801 - 0.808 \, M_L \qquad \text{corr} = 0.996.$$

This relationship predicts that the largest earthquake during the period sample should have been magnitude of 3.5. The largest earthquake actually observed was magnitude 4.2. Extrapolation of the relationship indicates that the largest earthquake to be expected in one hundred years is predicted to have a magnitude of 5.0.

The relationship for the data set for which the number of readings (not the number of stations) was greater than ten (Figure 15) is

$$\log \Sigma N = 2.613 - 0.769 \, M_L \qquad \text{corr} = 0.992.$$

And the relationship for those events with a quality rating of B and better (Figure 16) is

$$\log \Sigma N = 2.431 - 0.764 \, M_L \qquad \text{corr} = 0.993.$$
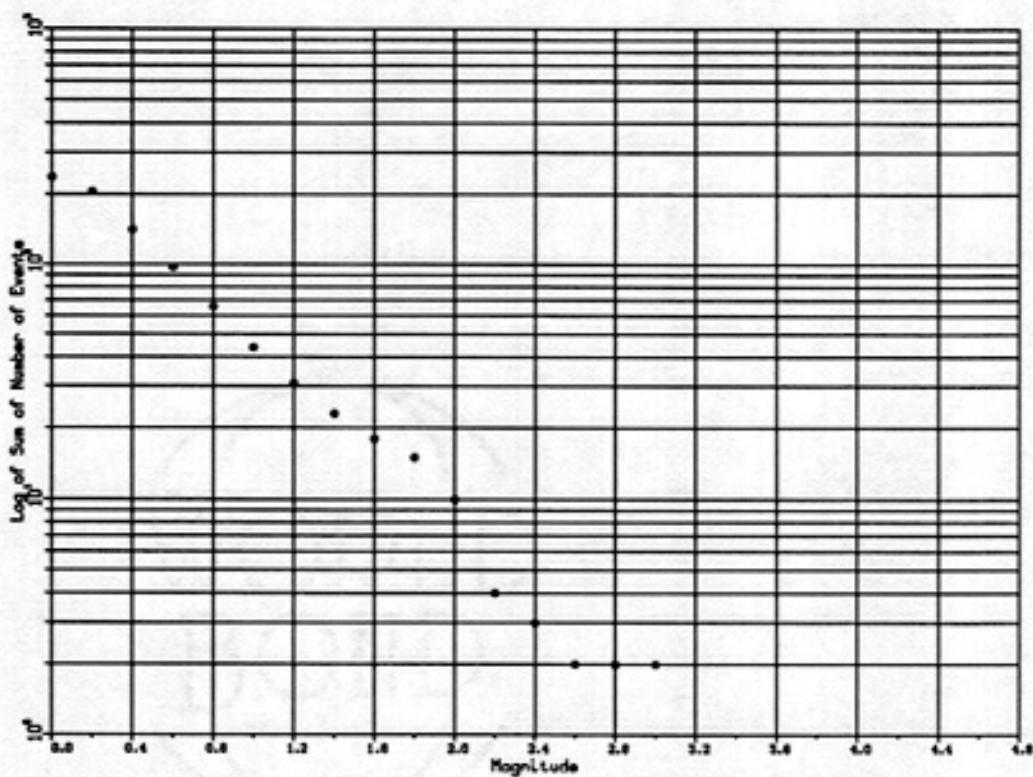
Figure 16.   A log sum N vs. magnitude plot for events with B quality or better solutions.

The b value for the entire data set, –0.808, is slightly higher than the value Jarpe (1984) found, –0.78. The b value for the B quality and better data set, –0.769, is higher than that found by King (1986) for the same quality data set for the entire Socorro area, –0.709.

Epicenters

Figure 17 is a map of all the epicenters of all the events in the study. It shows that the greatest concentration of events is five km NNE of San Acacia, with a second group five km east of the primary concentration. Figures 18 – 24 are maps of the epicenters of the earthquakes that occurred in each year during the study. The year 1983 was by far the most active of the study with a total of 190 events or 34.2% of all the events.
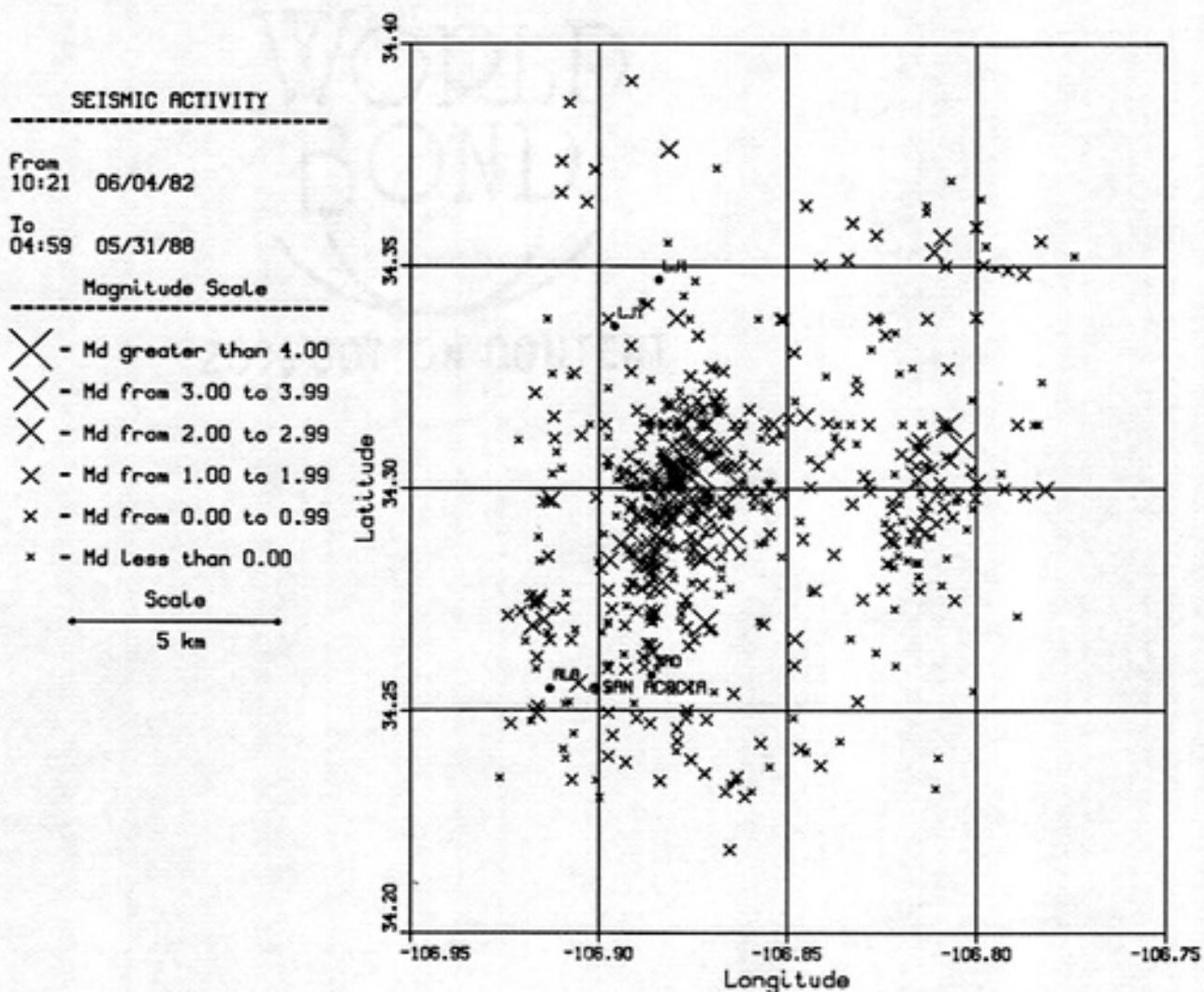
Figure 17   Map of all located events in the study area form 06/82 to 06/88.

Figures 25 – 27 show maps of the total data set subdivided according to the precision of the hypocentrer locations. Figure 28 ia a map of events with magnitudes greater than 1.0. Figure 29 shows epicenters for earthquakes in the 1983 swarm which have anomalous fault plane solutions.
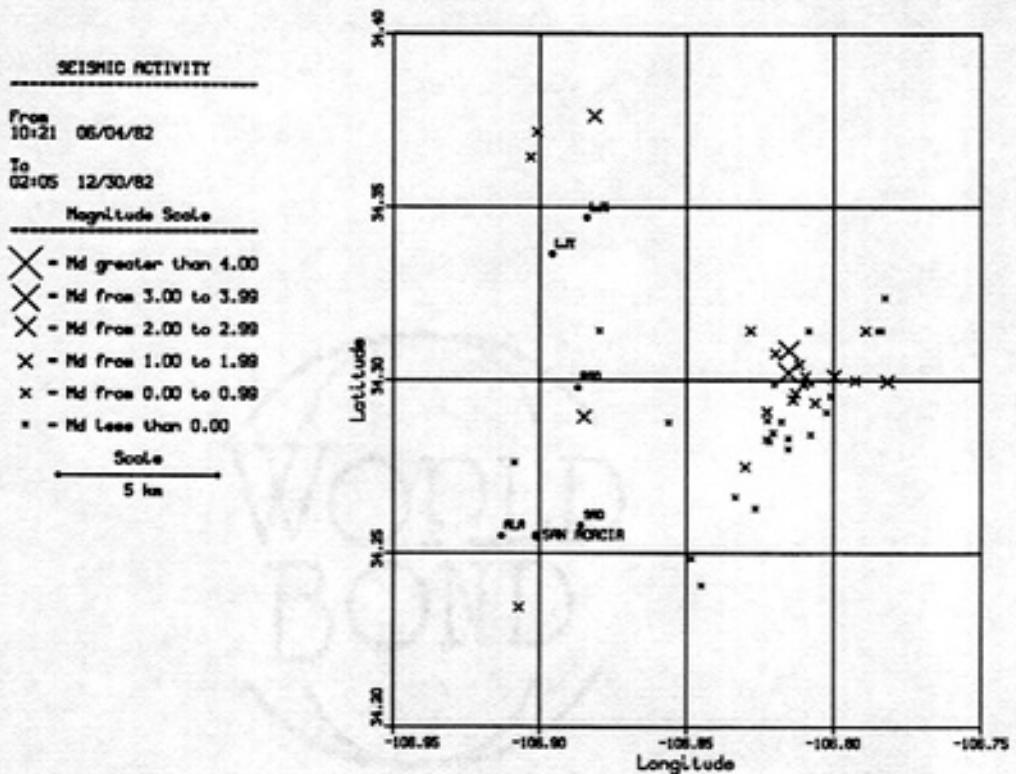
Figure 18.   Activity in the study area for the latter half of 1982.
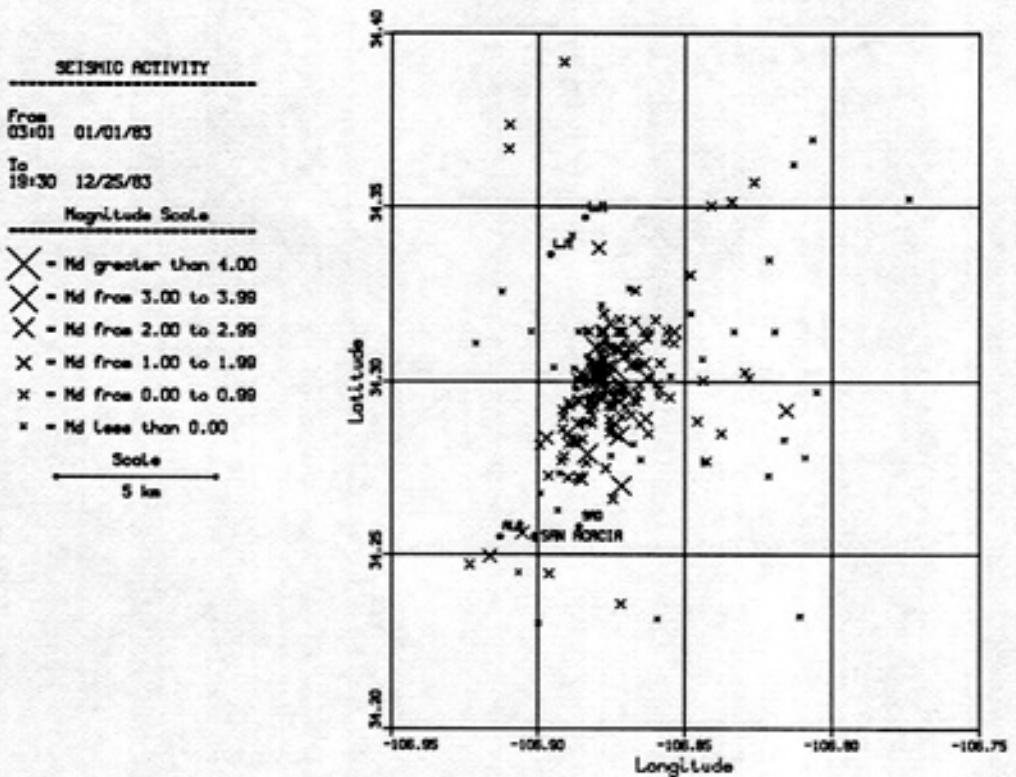
Figure 19.   Activity in the study area for 1983.

SEISMIC ACTIVITY

From
04:46 01/23/84

To
06:15 12/17/84

Magnitude Scale

X - Md greater than 4.00
X - Md from 3.00 to 3.99
X - Md from 2.00 to 2.99
x - Md from 1.00 to 1.99
x - Md from 0.00 to 0.99
. - Md less than 0.00

Scale
5 km
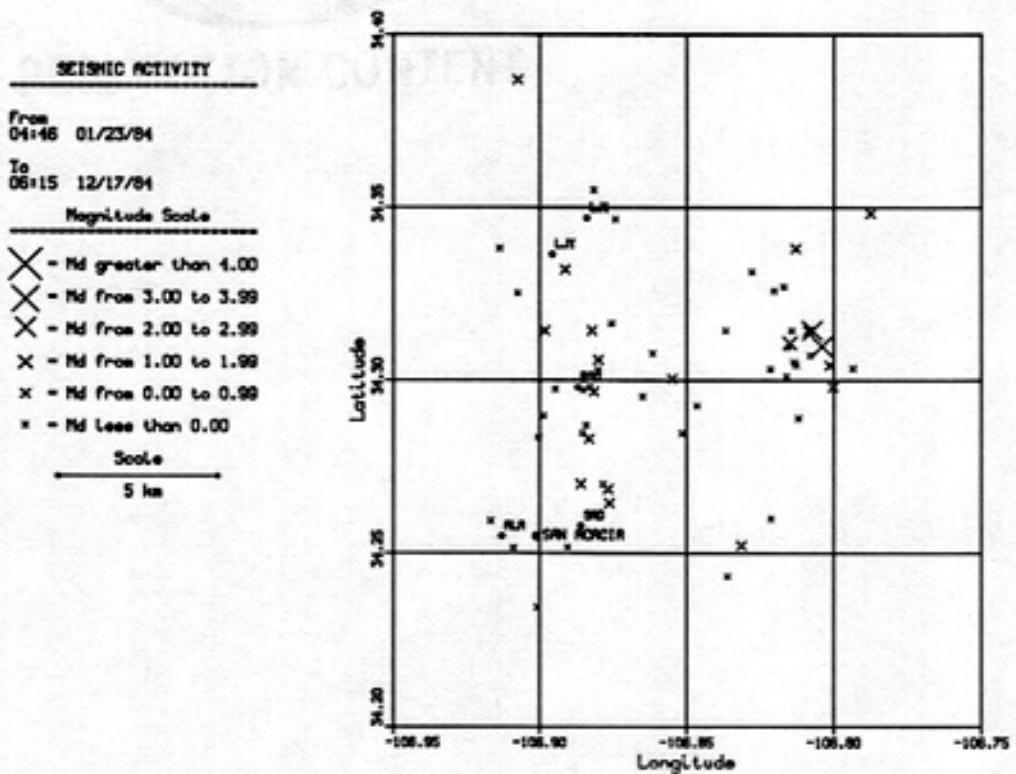
Figure 20.   Activity in the study area for the year 1984.

SEISMIC ACTIVITY

From
07:30 01/10/85

To
20:09 12/28/85

Magnitude Scale

X - Md greater than 4.00
X - Md from 3.00 to 3.99
X - Md from 2.00 to 2.99
x - Md from 1.00 to 1.99
x - Md from 0.00 to 0.99
. - Md less than 0.00

Scale
5 km
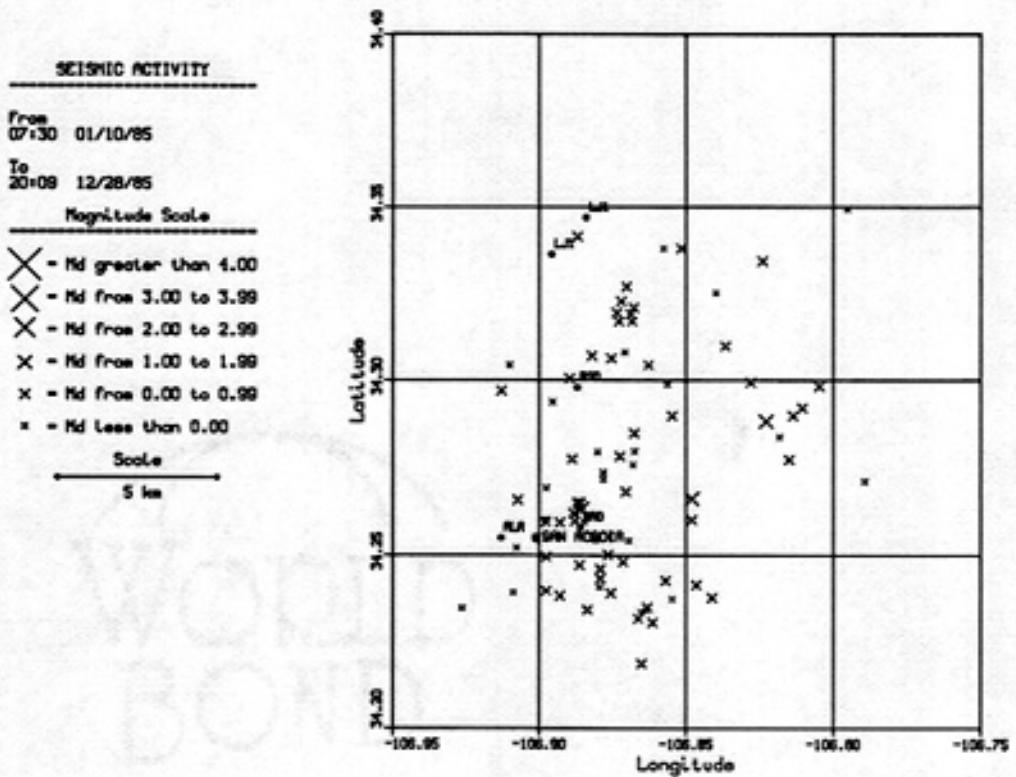
Figure 21.   Activity in the study area for the year 1985.
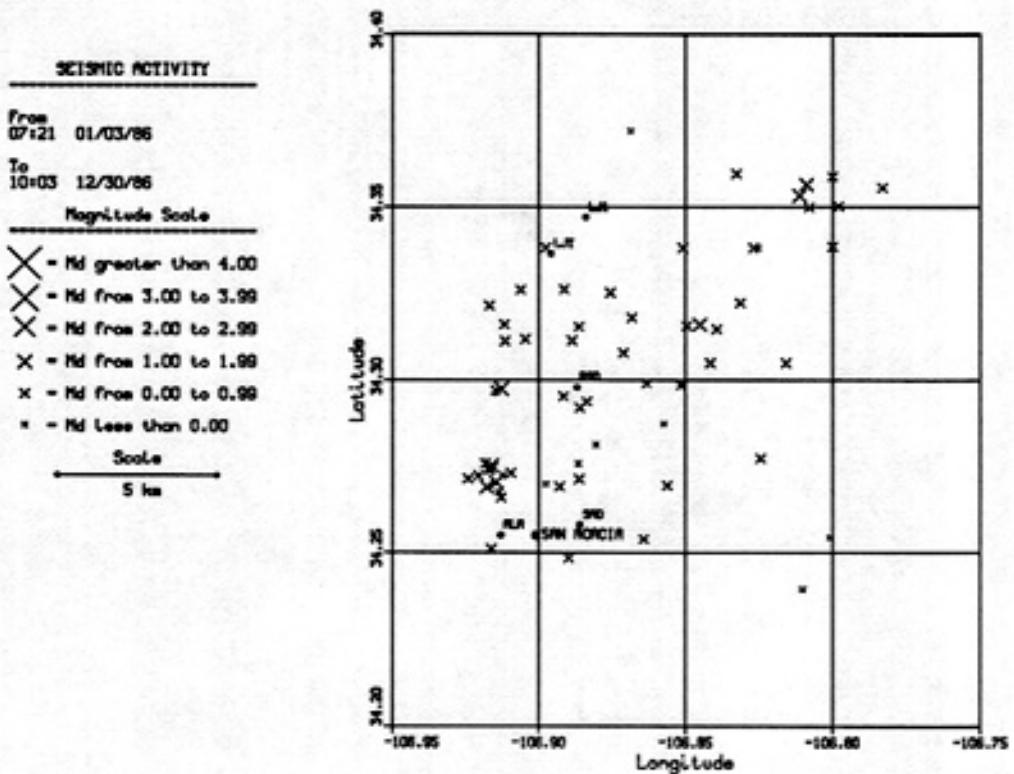
Figure 22. Activity in the study area for the year 1986.
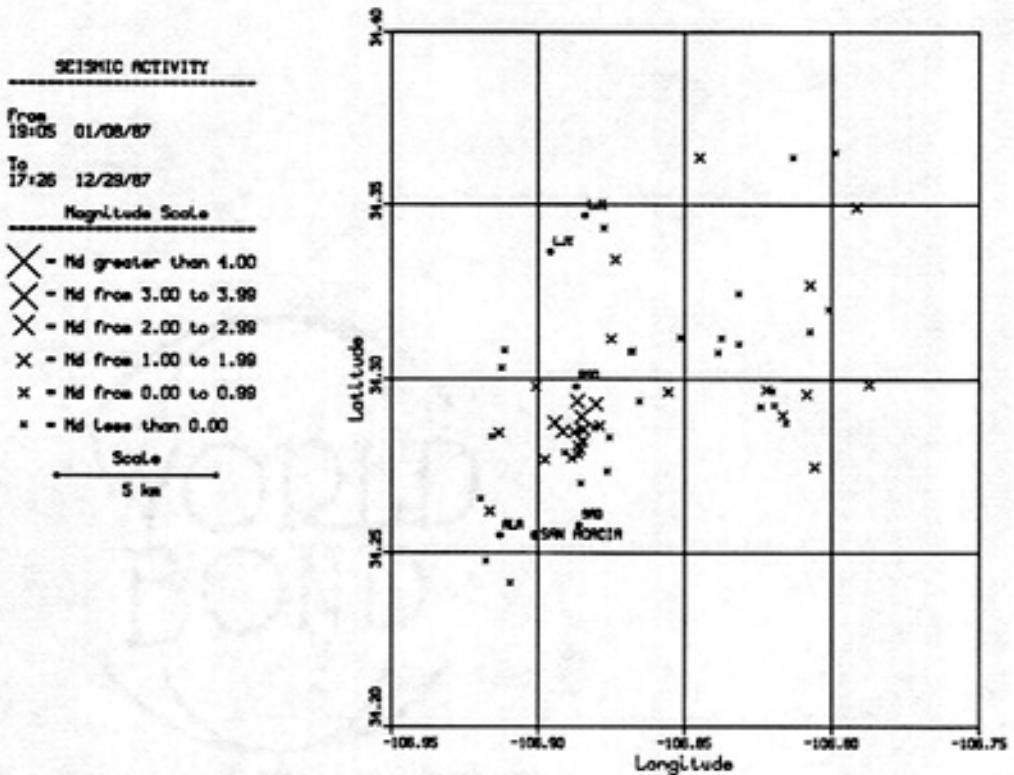
Figure 23. Activity in the study area for the year 1987.
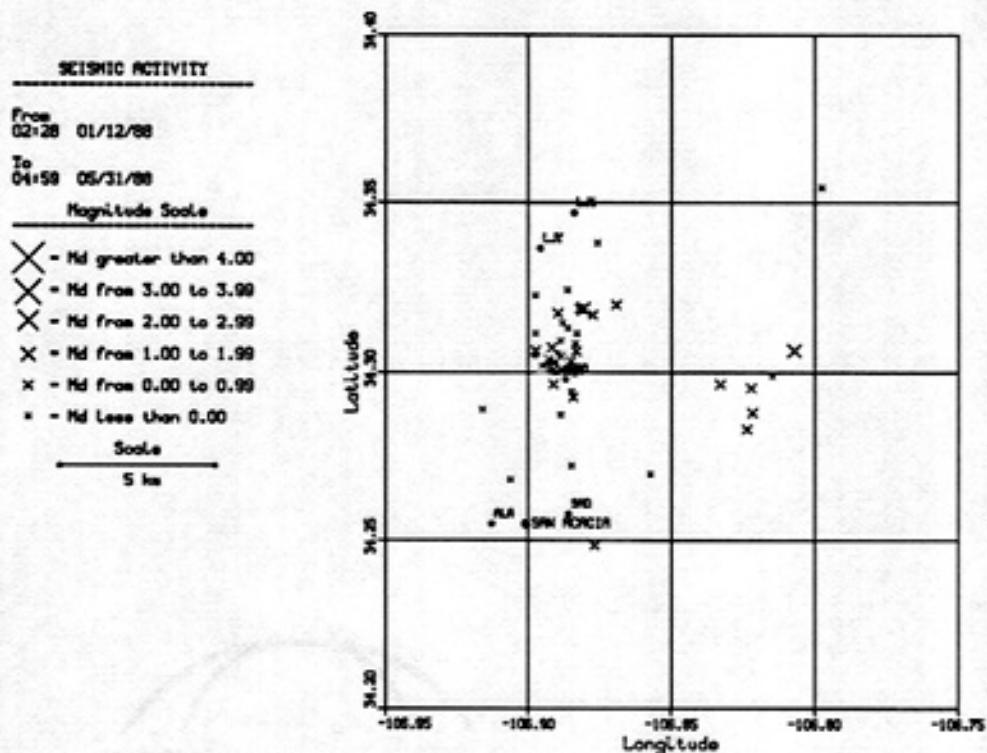
Figure 24. Activity in the study area for the first half of 1988.
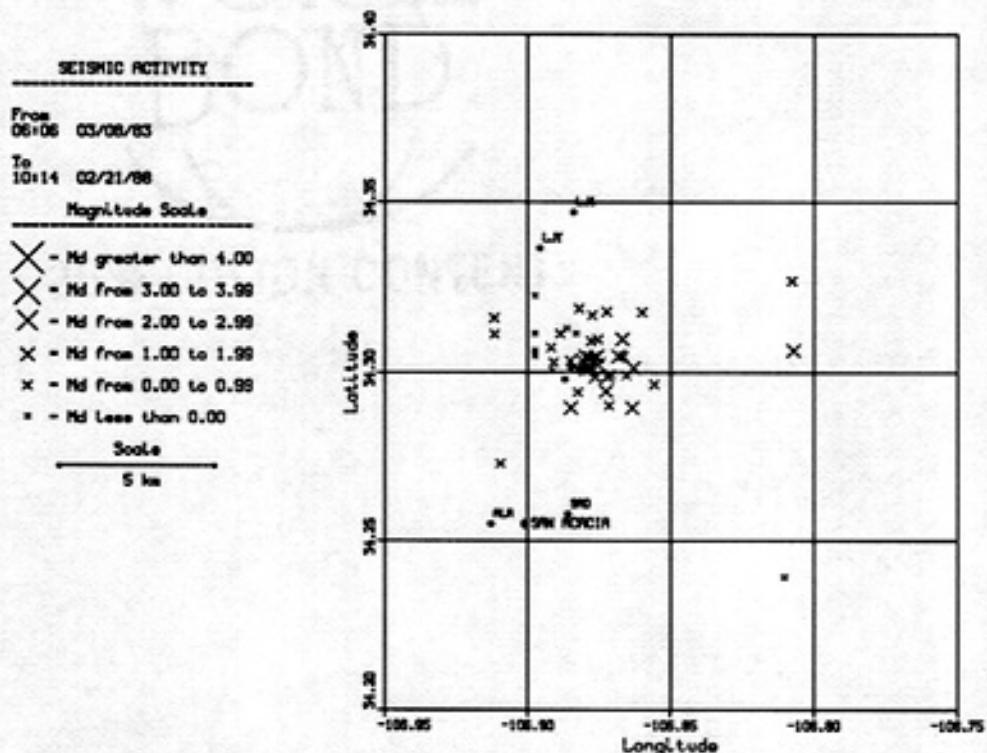
Figure 25. Map of located events in the study area from 06/82 to 06/88 with HYPO71 ERH $\leq$ 0.5 km and ERZ $\leq$ 1.0 km.
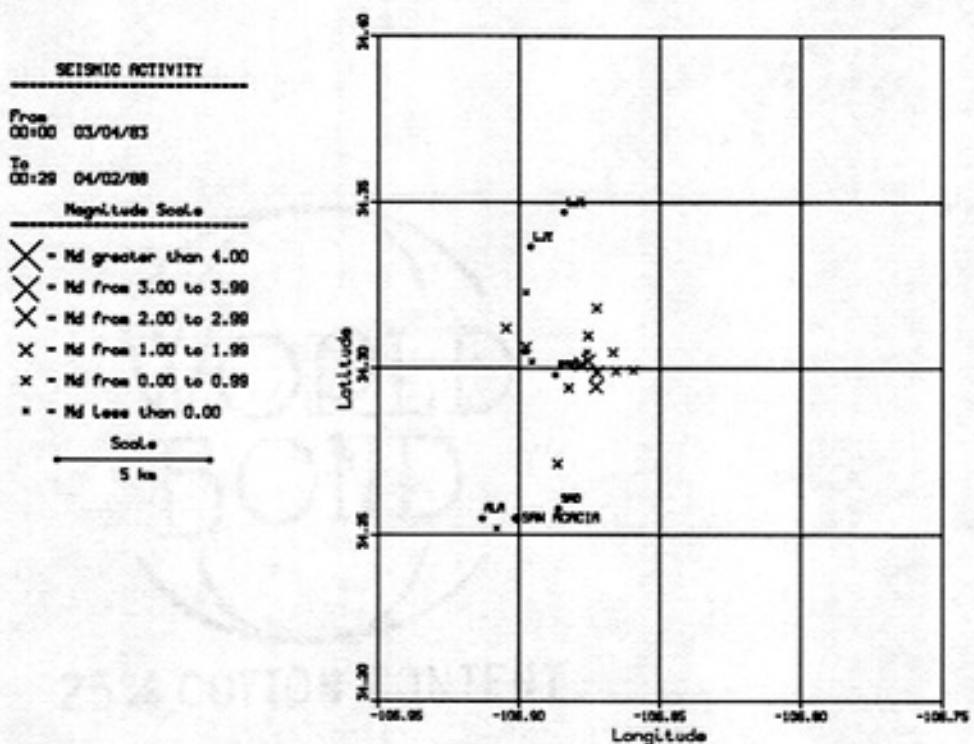
Figure 26. Map of located events in the study area from 06/82 to 06/88 with HYPO71 quality A hypocenters.
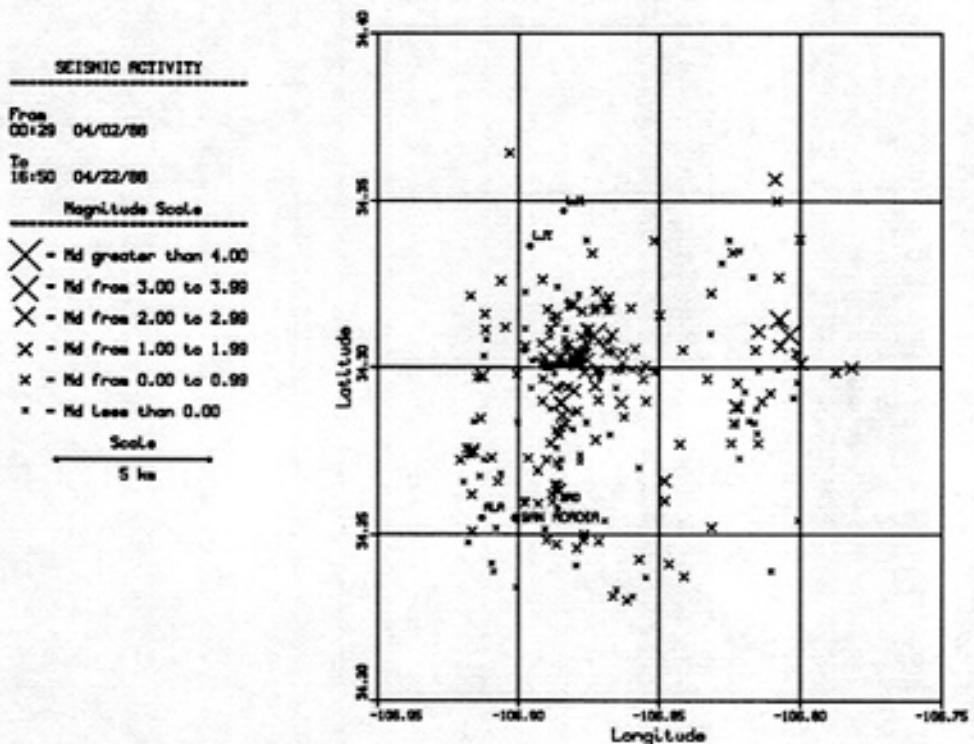
Figure 27. Map of located events in the study area from 06/82 to 06/88 with HYPO71 quality B hypocenters.
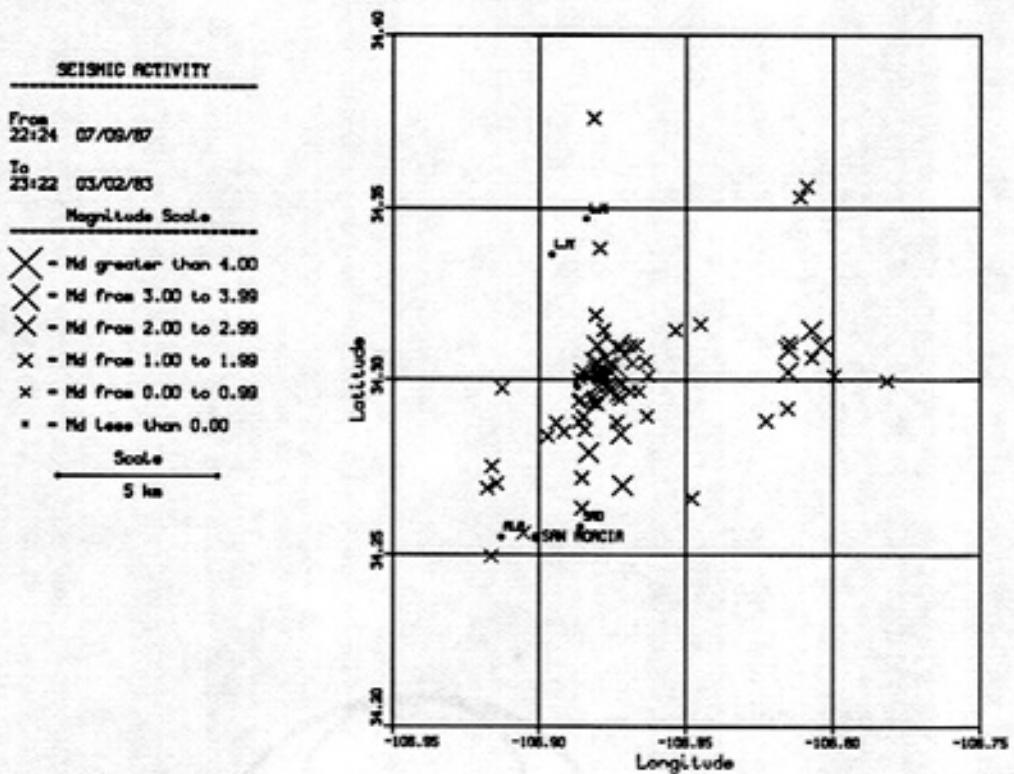
Figure 28.   Map of events with magnitude greater than 1.0 in the study area from 06/82 to 06/88.

SEISMIC ACTIVITY
From
11:15 02/26/83
To
11:46 03/11/83

Magnitude Scale

- Md greater than 4.00
- Md from 3.00 to 3.99
- Md from 2.00 to 2.99
- Md from 1.00 to 1.99
- Md from 0.00 to 0.99
- Md less than 0.00

Scale
5 km
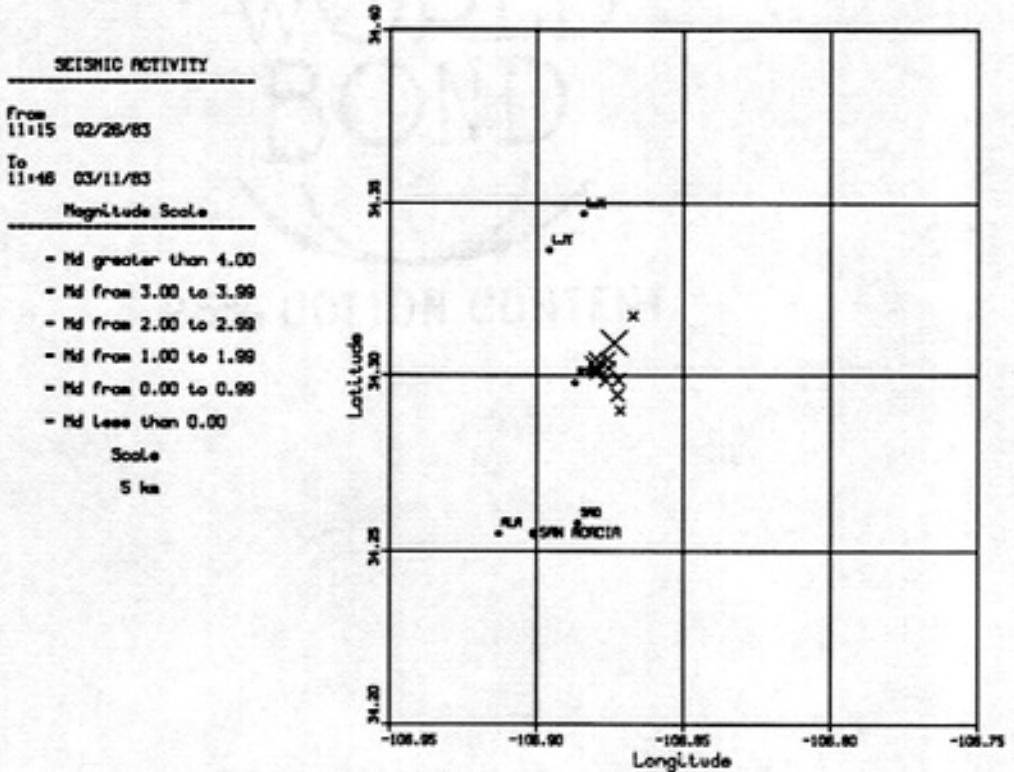
Figure 29.   Map of events that had anamolous fault plane solutions during the 1983 swarm (Jarpe, 1984).

Hypocenters

Comparison of B quality and better hypocentral depths for the San Acacia area (Figure 30) with those for the Socorro area as a whole (Figure 31) shows a broader distribution than the tight 4 to 12 km. seismogenic zone seen by King, 1986. The precisely located events of both the present study (Figure 32) and the smaller Jarpe (1984) study (Figure 33), show a smaller and shallower seismogenic zone than for the Socorro area as a whole (King, 1986). Even the depth histograms for the whole data set (Figure 34) and for the set of large ($M_L \geq 1.0$) earthquakes (Figure 35) shows a trend toward shallower hypocenters even though the HYPO71 default depth of 7 km. is clearly evident.

Appendix B contains three dimensional diagrams of the distribution of hypocenters in the study area. These hypocenters plotted in three dimensions are viewed from a succession of azimithal angles ranging from 0° to 180°, advancing by 10° . These
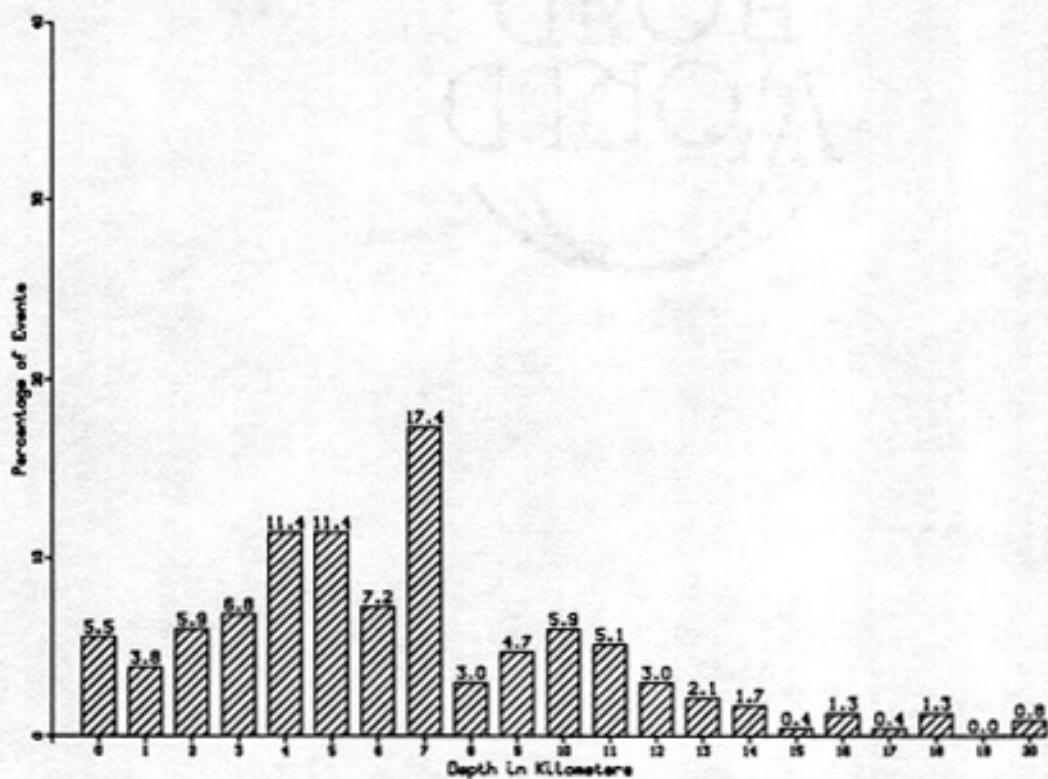
Figure 30.   Depth histogram for B quality and better hypocenters in study area.
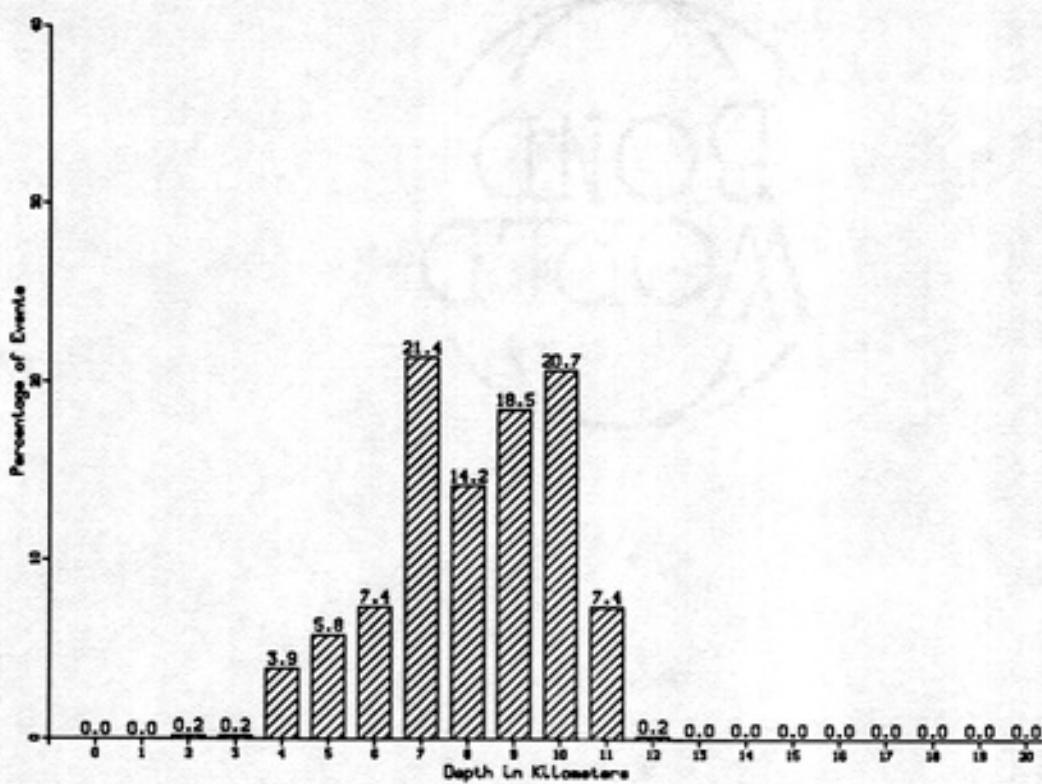
Figure 31. Depth histogram for B quality and better hypocenters for Socorro area (after King(1986)).
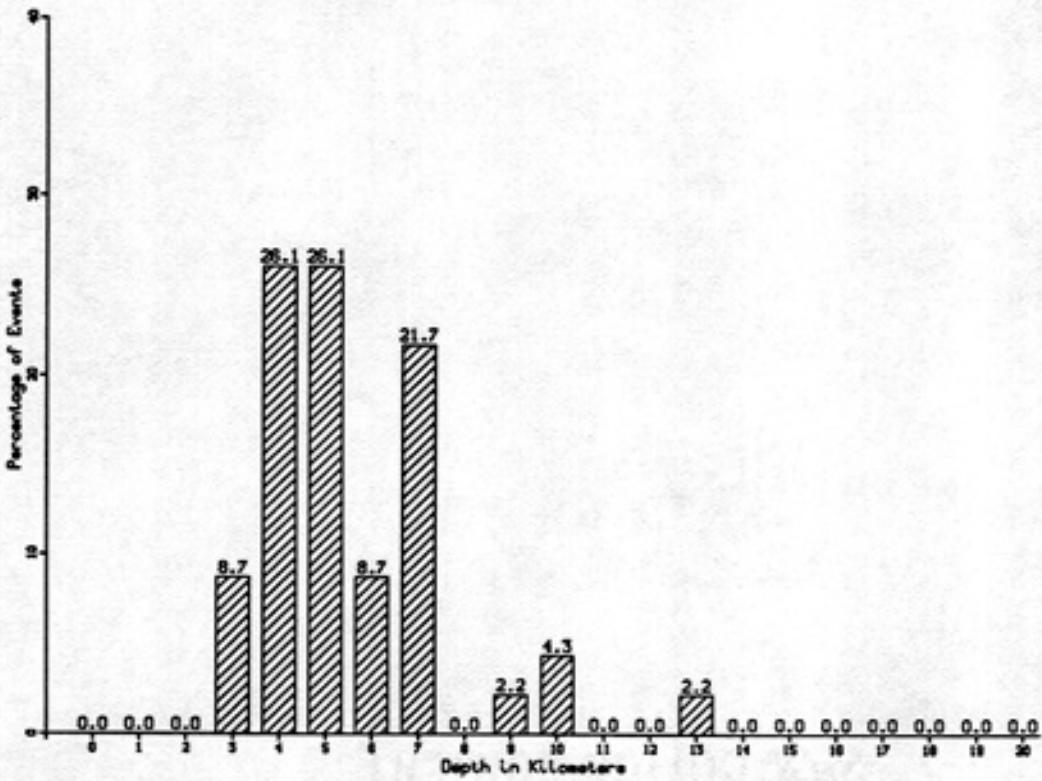
Figure 32. Depth histogram for the precisely located hypocenters (HYPO71, ERH ≤ 0.5, ERZ ≤ 1.0).
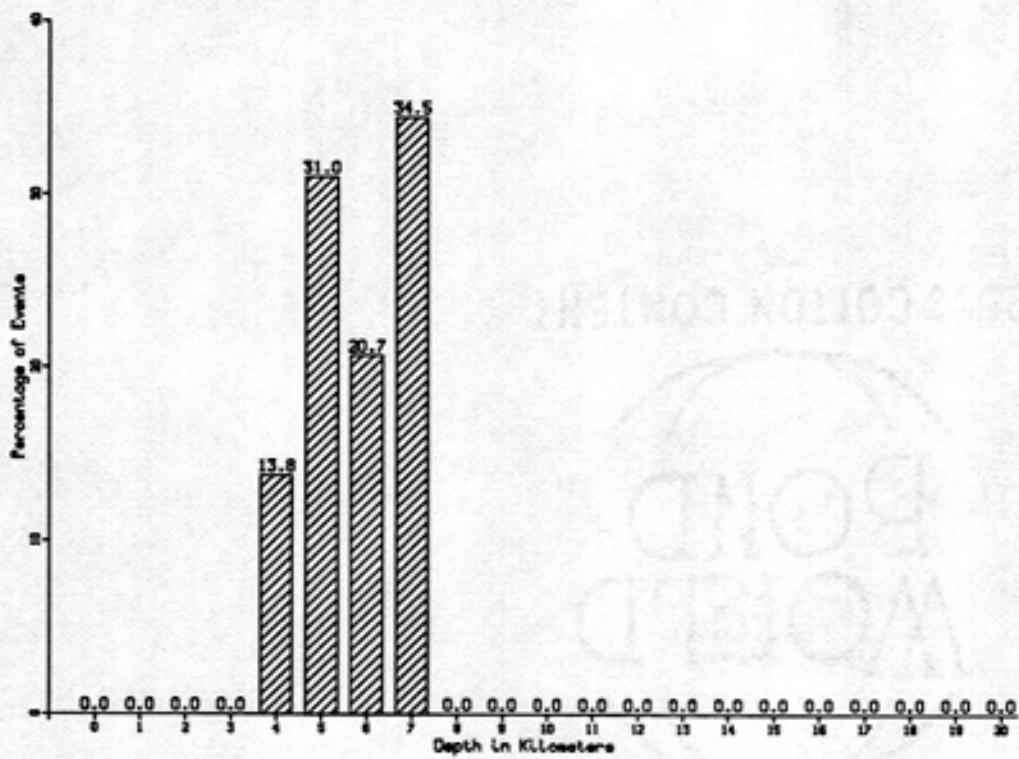
Figure 33.   Depth histogram for the Jarpe (1983) precisely located hypocenters (HYPO71, ERH ≤ 0.4, ERZ ≤ 0.6).
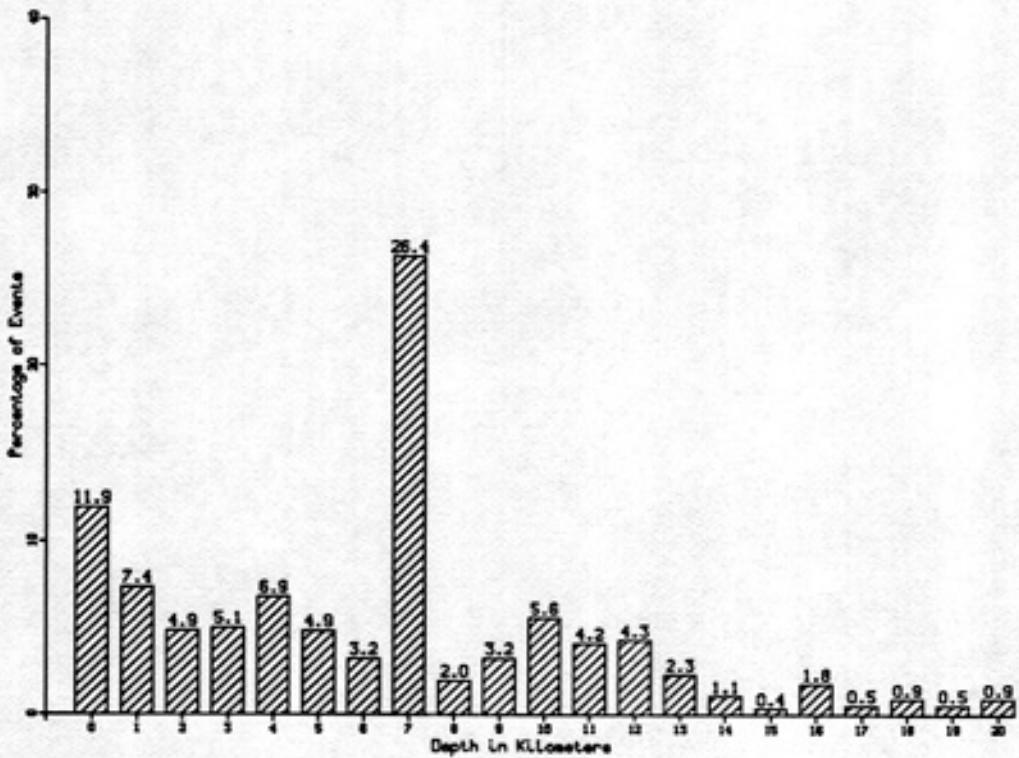
Figure 34.   Depth histogram for all hypocenters in study area (06/82 – 06/88).
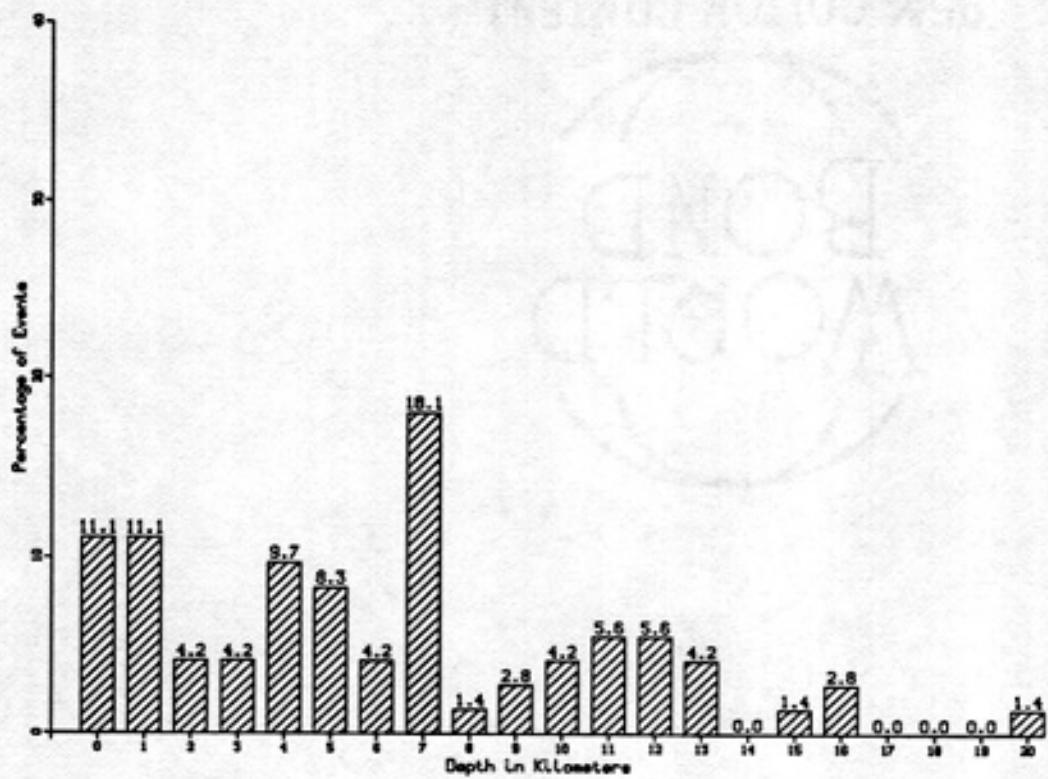
Figure 35.   Depth histogram for earthquakes with $M_D \geq 1.0$ in study area (06/82 – 06/88).

Precise events from 130 degrees
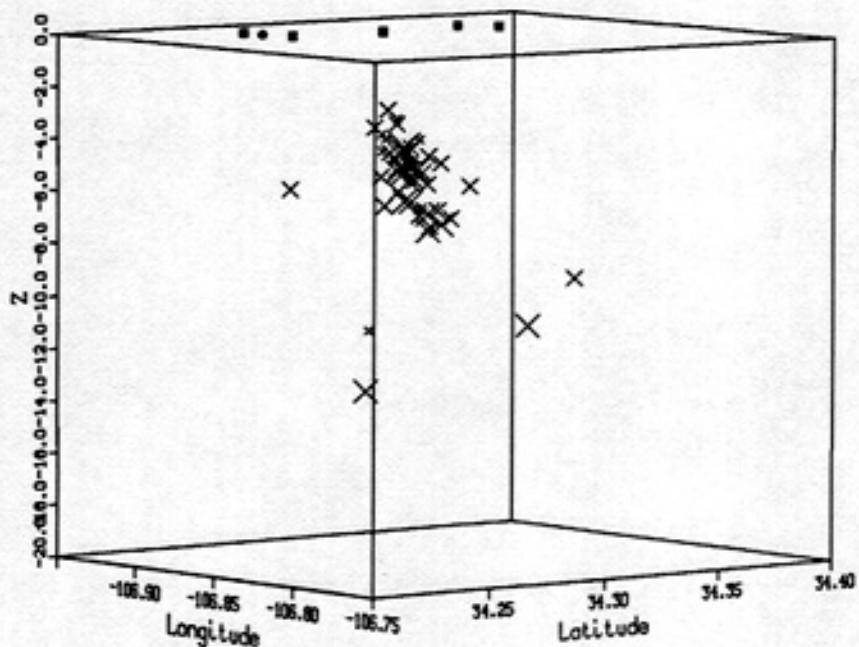
Figure 36.   3–D plot showing the semi–planar volume defined by the hypocenters.

figures were used to detect a planar volume encompassing all the hypocenters. Figure 36 is the best view for the precise subset of hypocenters. Viewed form an angle of 130° there is a semi–planar volume at a dip of - 45° to the northeast. There is no correlation between this apparent planar orientation and surface faulting.

Appendix C contains maps of the 39 earthquake swarms that took place in the San Acacia area during the study period. For the purpose of this study a swarm was defined as a group of three or more earthquakes that averaged more than one earthquake per day without a gap of more than six days. These maps shows each epicenter plotted with a number representing the order of occurrence in the swarm. The large 1983 swarm was divided into sections of no more than twenty earthquakes in the interest of clarity.

First Motions

Jarpe (1984) studied the large earthquake swarm that occurred in the study area in February and March 1983.In determining fault plane solutions for many of the swarm earthquakes, he found several that could not be explained by the standard DCWM (Double Couple Without Moment) model. These solutions had a nearly totally compressive hemisphere (Figure 37). The portable stations set out in the area during part of the swarm allowed good control of the solution. Jarpe postulated that a LVD (Linear Vector Dipole) model in conjunction with a DCWM model (Figure 38) could explain the anomalous fault plane solutions. Physically, this would correspond to simultaneous opening and lateral slipping along a pre–existing fault or joint.

In the course of compiling a first motion catalog for the stronger shocks from 6/82 to 6/88, a small precursor of smaller amplitude and lower frequency (Figure 39) than the next motion was observed on some earthquake seismograms (Table 3). These precursors should be the subject of further scrutiny.
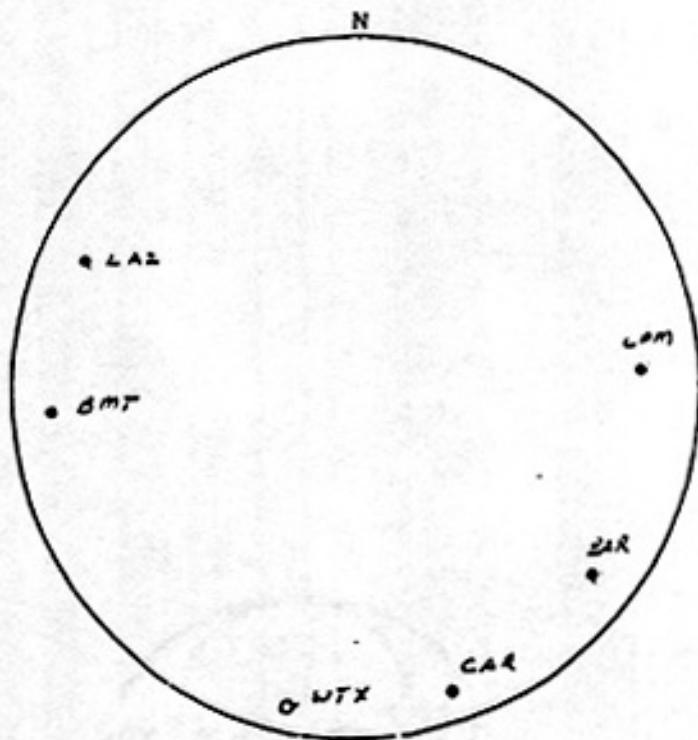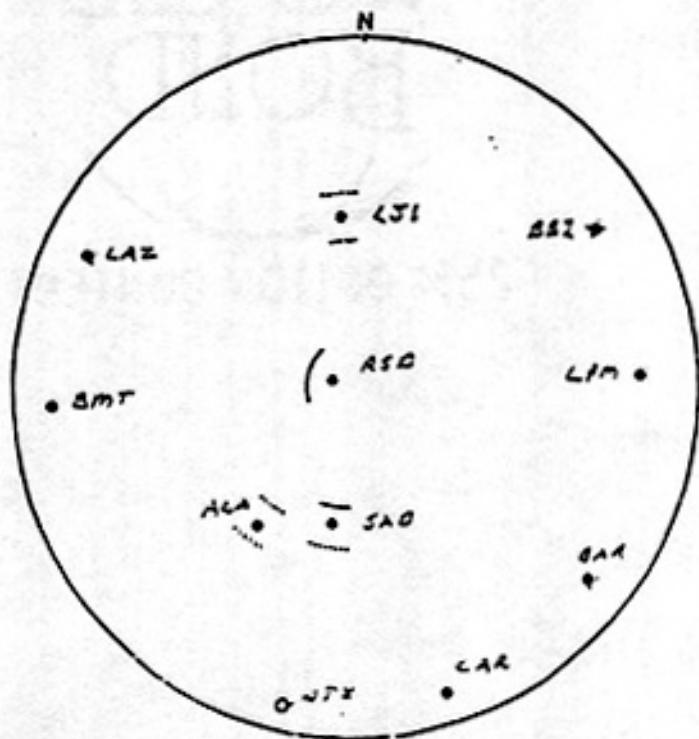
Figure 37. The upper figure shows a non-DCWM fault plane solution for anamolous earthquake with very little dilational area (Jarpe, 1984). The lower figure shows the same solution wihout the data from the portable seismometers. Without the information from the temporary sensors a normal DCWM solution can be fitted. This illustrates the difficulty in observing an event as anomalous unless there are sensors within the immediate vicinity.

FAULT PLANE
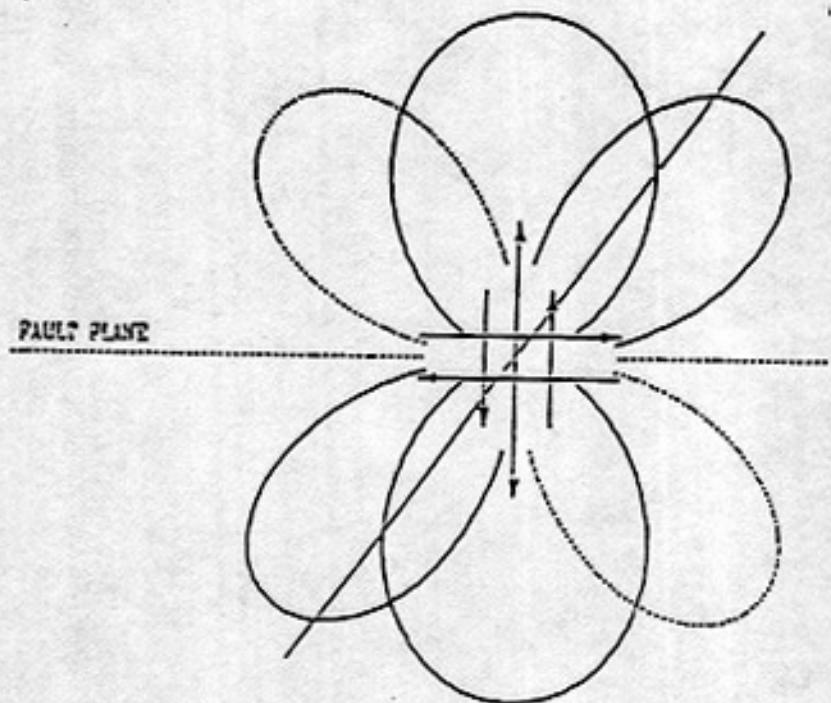
Figure 38. If a Linear Vector Dipole model is projected onto a Double Couple Without Moment model the over lapping compressional fields, shown with solid lobes, can create a nearly total compressional hemisphere. The dilational fields, shown with dotted lobes, are overshadowed by the two compressional fields.
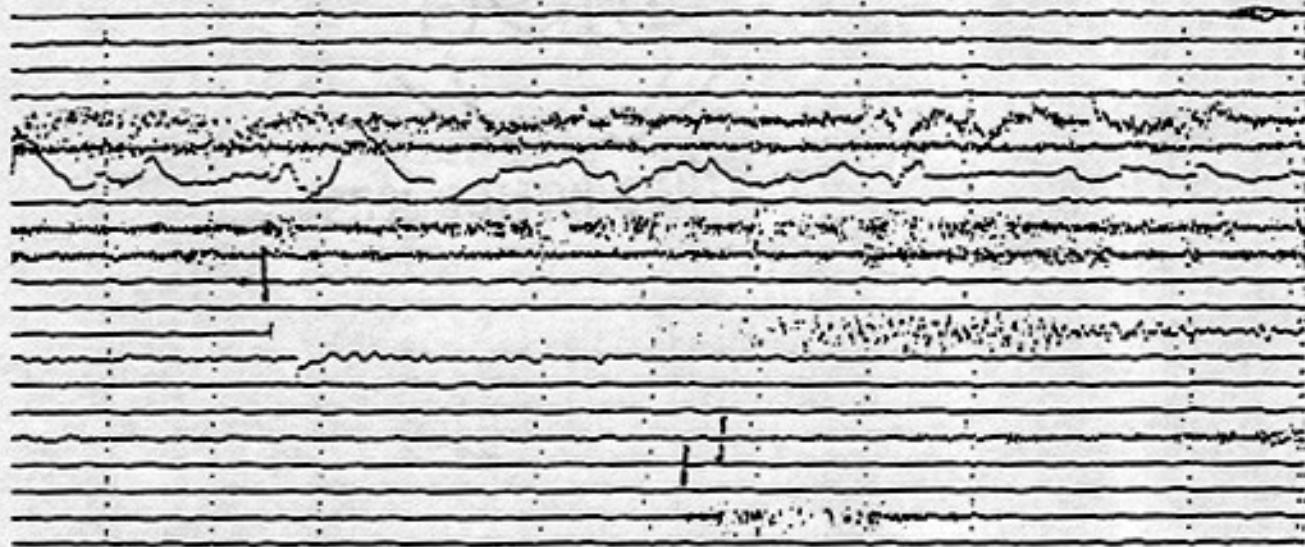
Figure 39. A earthquake recorded on a short period analog seismograph shows the small lower frequecy precursor found on some earthquake recordings from the study area.

TABLE 3

Stations in order of azimuth from events

First Motions   U = Compressive   D = Dilational

Date	Time	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
82 824	758 36.00	D		U		U					U			U		D									
82 9 3	2111 33.54	D		U	D	D					U			U		D									
82 918	339 37.57	D		U	D	D			U		D			D		D							D		
82 918	341 14.63	D		U		D			D		D			U		D							D		
8210 7	1241 25.99	U		U	U	D			U		D			D		U							D		
8211 3	922 27.08	D		U	U	D			D		U			U		D?							U		
83 225	257 54.31			U	U	U			D		D					U				U			U		
83 225	849 55.51				U	D			D		D					U				U			U		
83 226	1115 41.05			U	U	U			D		D			D		U				U			U		
83 226	1136 44.35			U	U	U			D		U			~		U				U			U		
83 226	1553 38.03			U	U	U			D		D			~		U				U			U		
83 226	1719 43.45			U	U	D			U		D			~		U				U			U		
83 226	19 0 42.48			U	U	D			U		D			~		U				U			D		
83 228	1349 13.40			U	D	U			U		D			D		D				U			U		
83 228	2312 42.07			U		U			U		U			D U		U				U			U		
83 3 2	2322 18.61				U	D			D		D					U				U			U		
83 3 3	1119 0.05			U	U	U			U		U	U				U	U			U			D		
83 3 3	16 7 0.04			U	D	U					U	U U	U			U	D			U			D		U
83 3 3	1740 0.05			U	U	D			D		D	U	U			U	D			U			D		D
83 3 3	2235 0.02			U	U	U			D		D	U	U			U	U			U			U		U
83 3 4	0 0 0.02		U	U	U	U	U		D		D	U	U			U	U			U			U		U
83 3 4	147 0.00		U	U	U	U	U U		D		D	U	D			U	U			U			U		U
83 3 4	149 0.01		D	U	U	U	U U		D		D	U	U			U	D			U			U		U
83 3 4	525 59.99		U	U	U	D	U U		D		U	U	U			U	U			U			U		U
83 3 4	1819 59.94		U	U	U	U	U		U		U	U				U	U			U					U
83 3 6	2213 29.85			U	U	U			D		U					U				U			D		U
83 3 8	6 6 0.05			U	U	D	U		D		U					U			U	U			D		U
83 3 8	619 0.01			U	U	U	U U		U		U			D		U			U	U			D		U
83 3 8	827 0.13			U	U	D	U D		D		D					U			U	U			D		D
83 3 9	9 4 60.00			U	U	D	D U U		D		D					U				U			U		
83 3 9	2325 0.01			U	U	D	U U		D		D					U		U		U			U	U	
83 311	1046 13.48			U	U	D			U		U					U		U		U			U	D	
83 312	21 8 16.53			U	U				D		D					U		U		U			U		
83 315	927 2.93			U		U			U		U			U		U							U		
83 316	830 29.28			U	U	U			D		U			U		U				U			D		
83 317	2235 52.14			U	U	D			D		D			D		U				D			D		
83 319	2310 55.17			U	U	D			U		D			~		D				U			U		
83 323	1 0 32.55			U	U	D					D			D		U				U			U		
83 325	1252 20.76			U	U	D			D		D			~		U				U			U		
83 331	1610 8.73			U	U	U			D		D			D		D				D			D		
83 414	1323 50.51			U	U	U			U		U			U D		U				U			D		
83 417	1134 27.69			U	U	U					U			~		U				U			U		
83 417	1742 7.78			U	U	U			D		U			~		U				U			D		
83 516	533 16.56			D	U	U			D		D			~						U			U		
83 811	2215 38.98			U	U	U					U			D		U							U		
84 826	219 54.23			U	U	D			D	U	D			D						D			D		

TABLE 3

Stations in order of azimuth from events

First Motions   U = Compressive   D = Dilational

Date	Time	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
8411 5	845 59.92			U		U			U		U			D	D							U	U	U	
8411 5	13 0 10.74			U		U			U		U			U	D							U	U	D	
85 425	1611 18.84			U	U	DU			U					U	U							U	U		
85 816	11 6 48.52			U	U	DD			U		U	U		U	U							U	D	U	
851031	1633 17.08			U	U	DD			D		DU			U	U							U	U	D	
861013	1216 27.59			U	U	UU			D		D	D			D							U	U	U	
861025	0 5 37.78			U	U	U			D		D	D		D	D							U	D		
861031	1516 29.82			U	U	DD			D		D	nr		U								U	U	D	
861031	1521 35.82			U	U	DD			D		U	D		U	U								D	D	
861221	4 9 19.51			U	U	U			U		U	U		U	U					U		U	U	D	
861222	624 18.94			U	U	U			U		U	U		U	nr					nr		U	U	D	
861222	1629 43.73			nr	U	U			D			U		U	?					nr		U	U	U	
87 7 9	2224 11.56			nr	U	U			UU		D	U		U	U					U		U	U	U	
87 725	1 6 34.80				U				DD		U	U?		U						U		U	U	U	
87 725	932 43.17			U	U				UU		U	U		D						U		U	U	D	
87 726	1312 33.23			U	U				U			U								U		U	U	U	
87 810	2145 50.93			U	U				DD			U		D						U		U	U	U	
87 818	2359 23.72			U	U	D			UU		D	U		U						U		D	U	U	
88 114	23 3 30.80				U	D			UU		U	U		U						U		D	U	D	
88 5 8	1159 45.86			U	U				U							U				U		U	U	D	

SUMMARY

Much of the seismic activity in the San Acacia study area occurs in swarms. Swarms typically occur in regions of recent, but not neccasarily current, volcanic activity (Richter, 1958). While the precisely located events (HYPO71, ERH $\leq$ 0.5, and ERZ $\leq$ 1.0) encompass a planar volume striking N50°W and dipping -45° to the northeast, the observed swarming, the uplift in the area, and the model of opening and slipping along joints for the anamolous fault plane solutions, all point to probable magma intrusion into the upper crust beneath the study area.

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Appendix A

3-D plots of the precise hypocenters

(symbols are increasing with magnitude)

3-D plots of the A quality hypocenters

(symbols are increasing with magnitude)

3-D plots of the Mag. > 1.0 hypocenters

(symbols are increasing with magnitude)

3-D plots of the AAA and BAB quality hypocenters

(symbols are decreasing with depth)

3-D plots of the anomalous fault plane solution

(symbols are decreasing with depth)

The angle is 0 degrees to the east and positive in the counterclockwise direction.

Each interval is ten degrees.

3-D plots of the precise hypocenters

(symbols are increasing with magnitude)

Precise
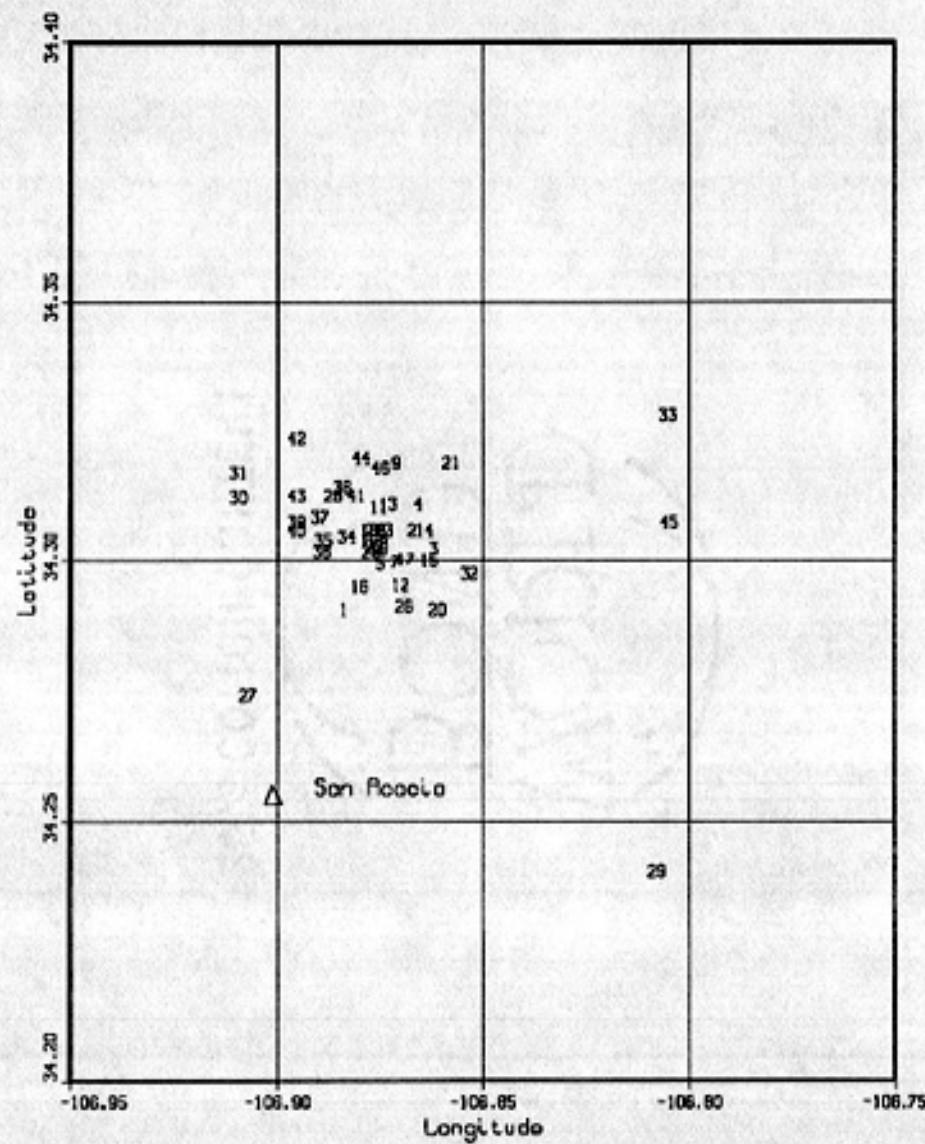
Precise events at 90

Precise events at 80

Precise events at 70

Precise events ot 6D
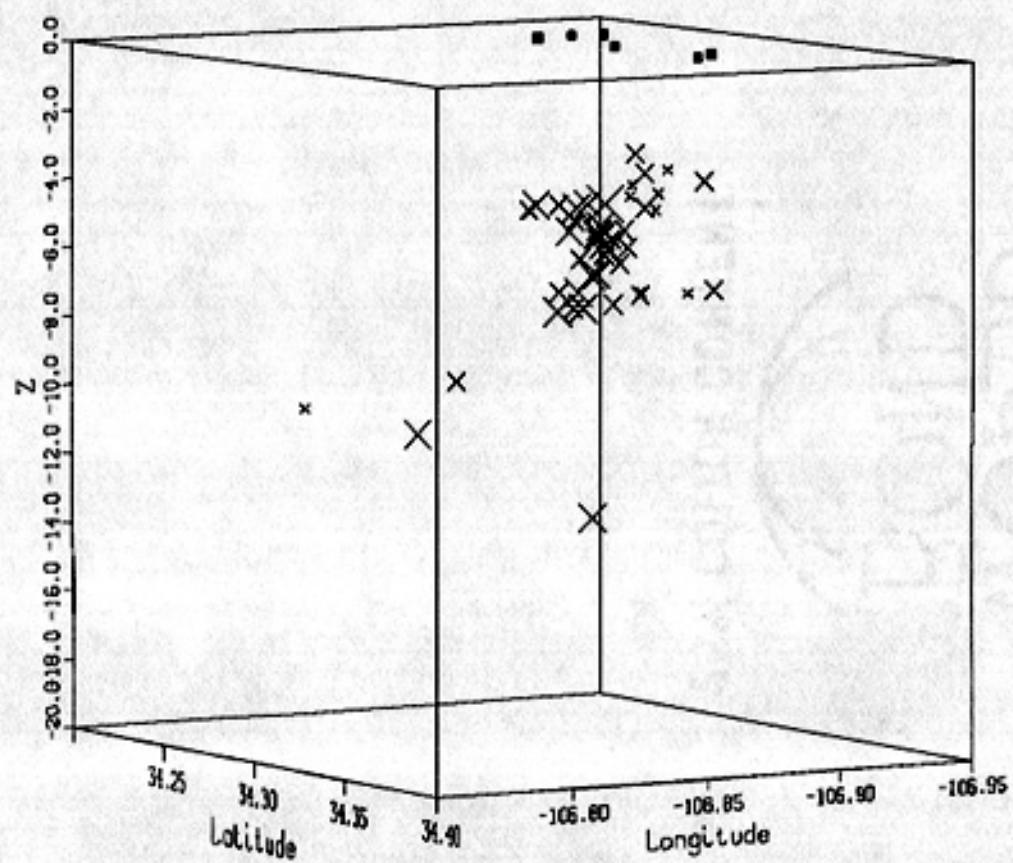
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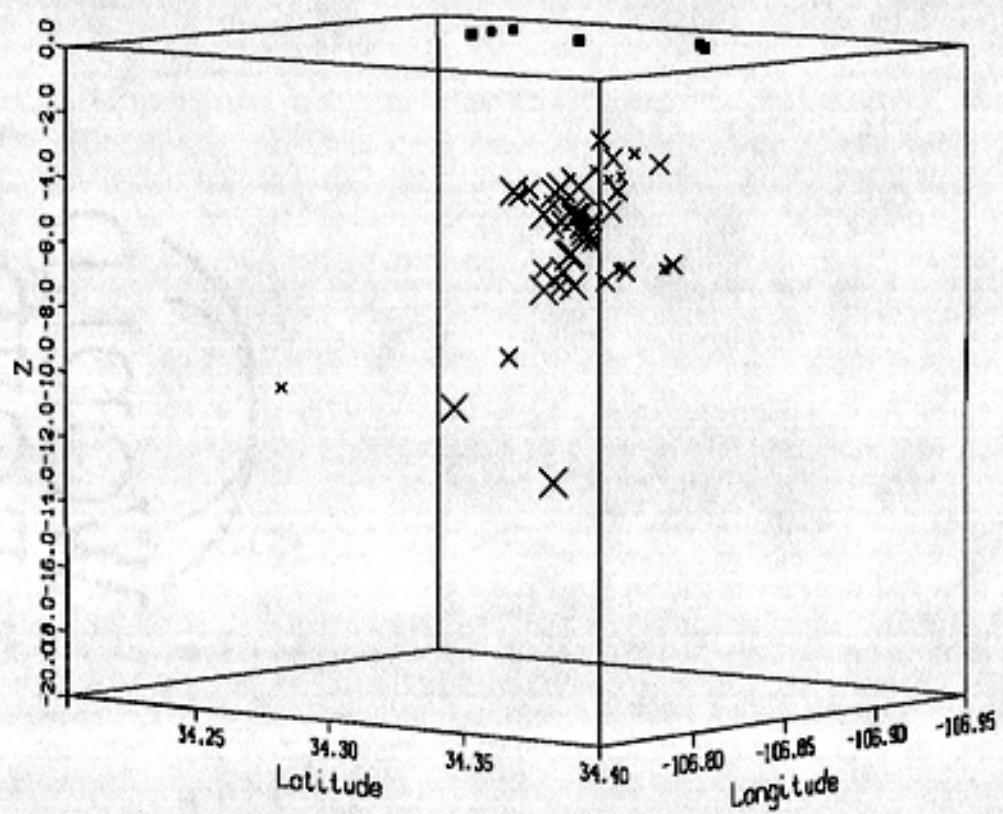
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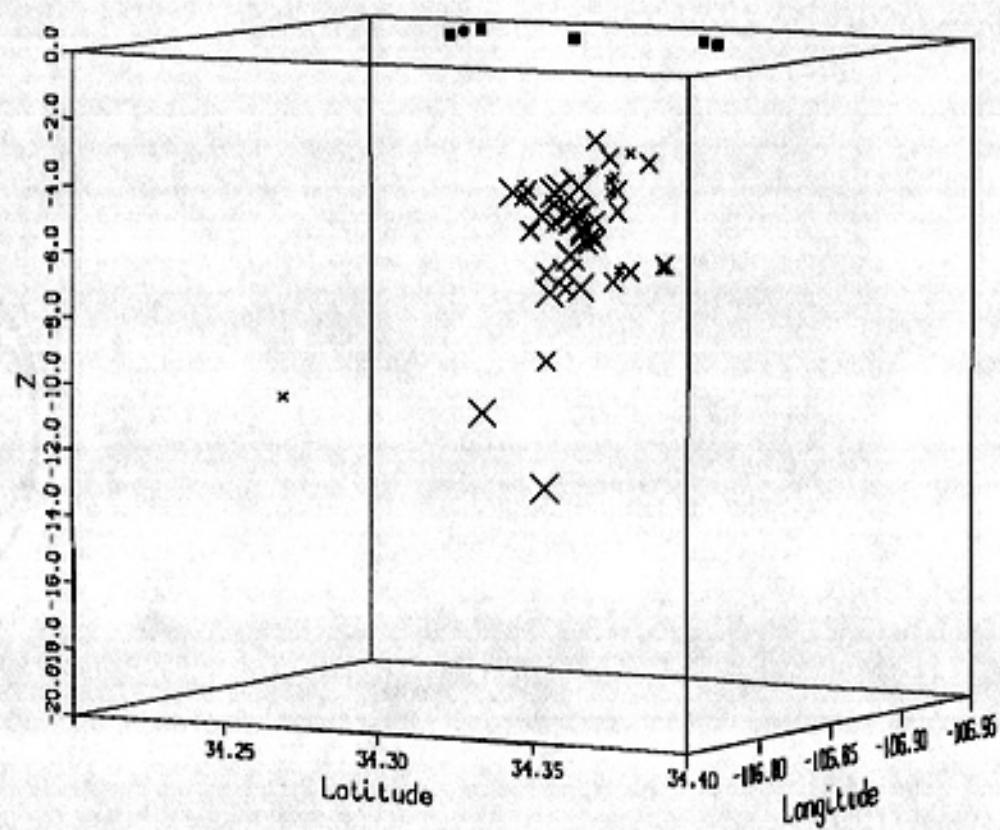
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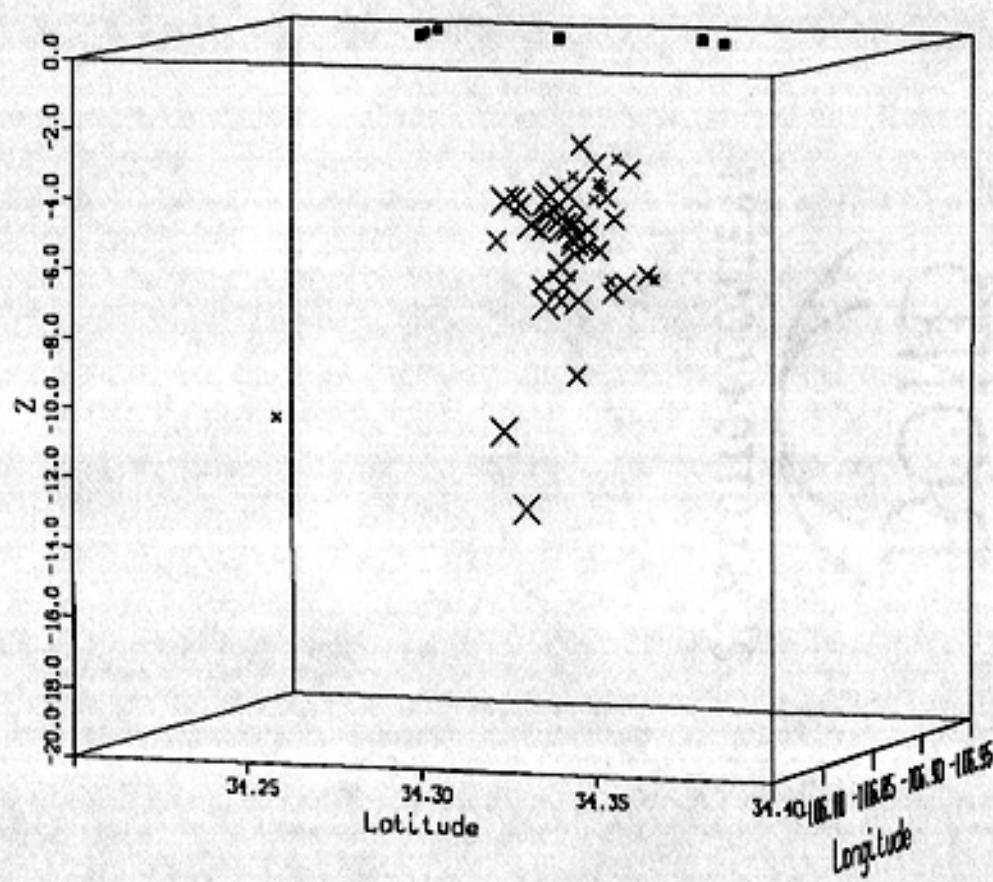
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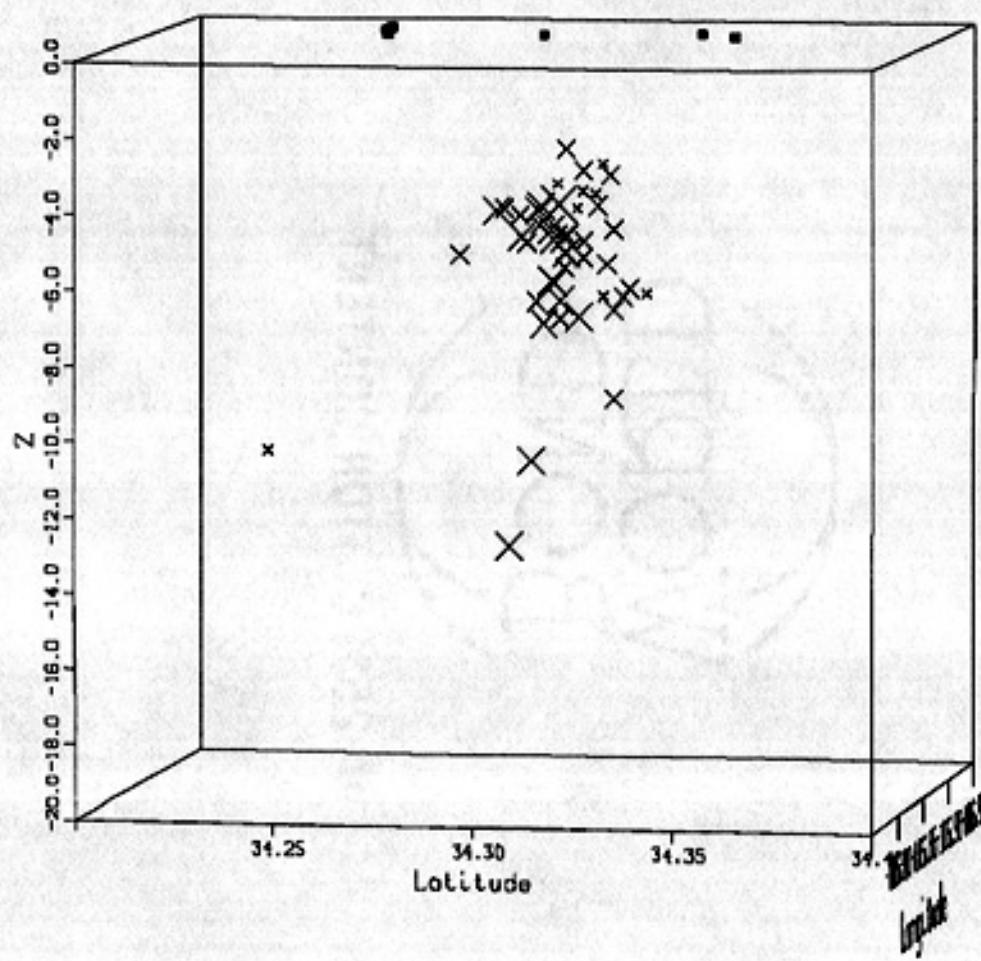
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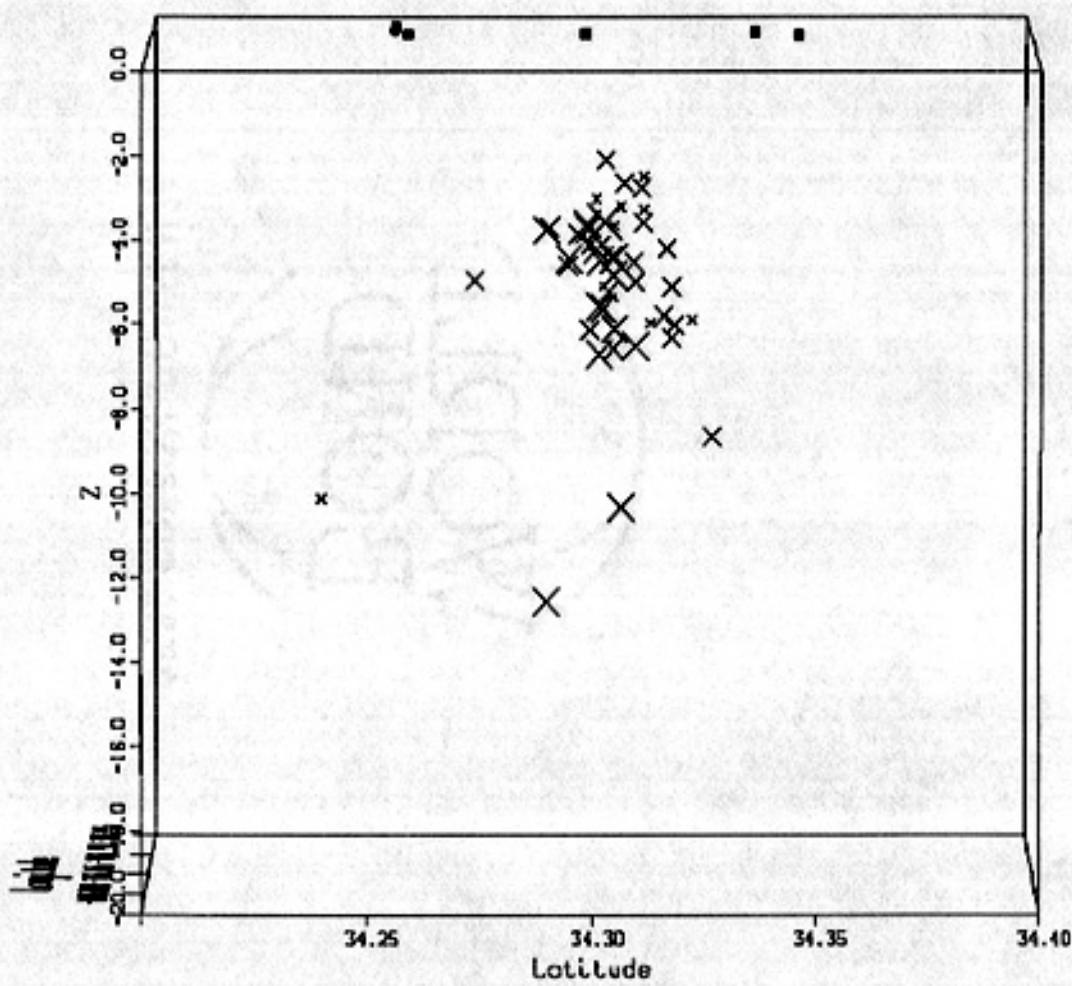
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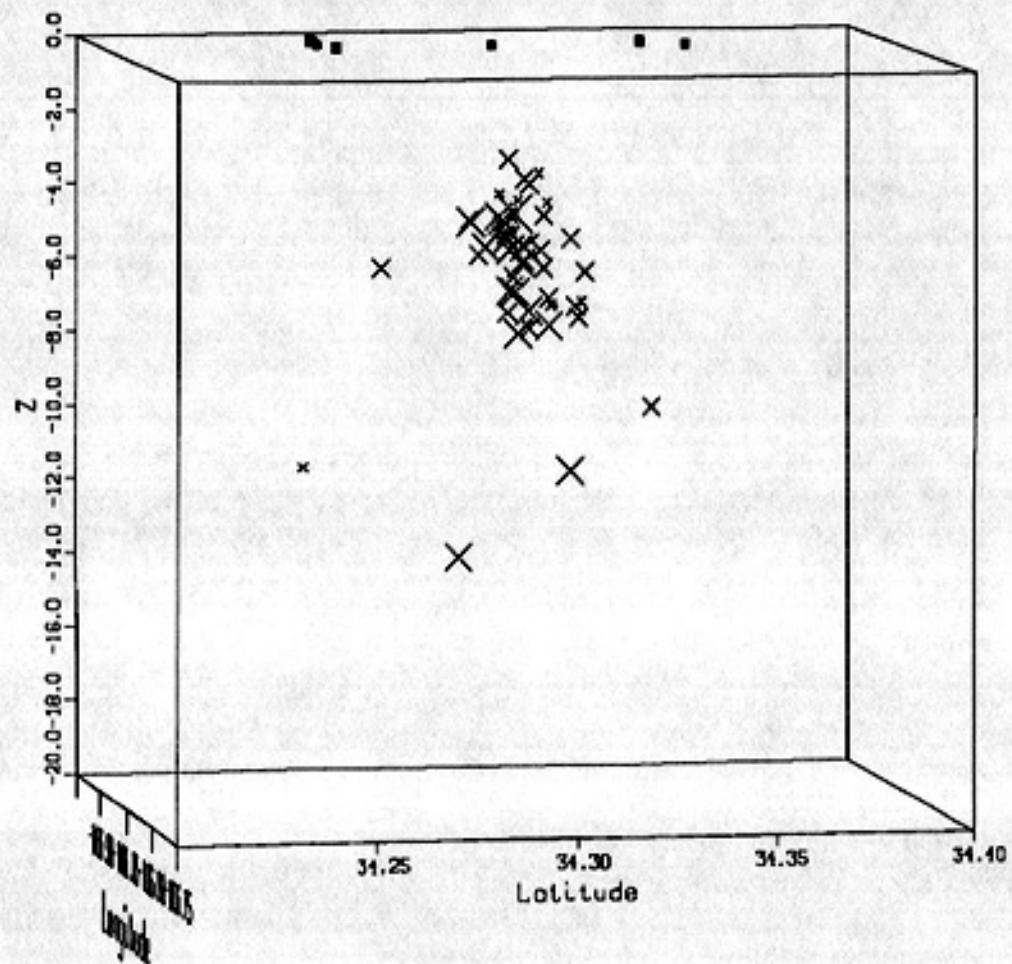
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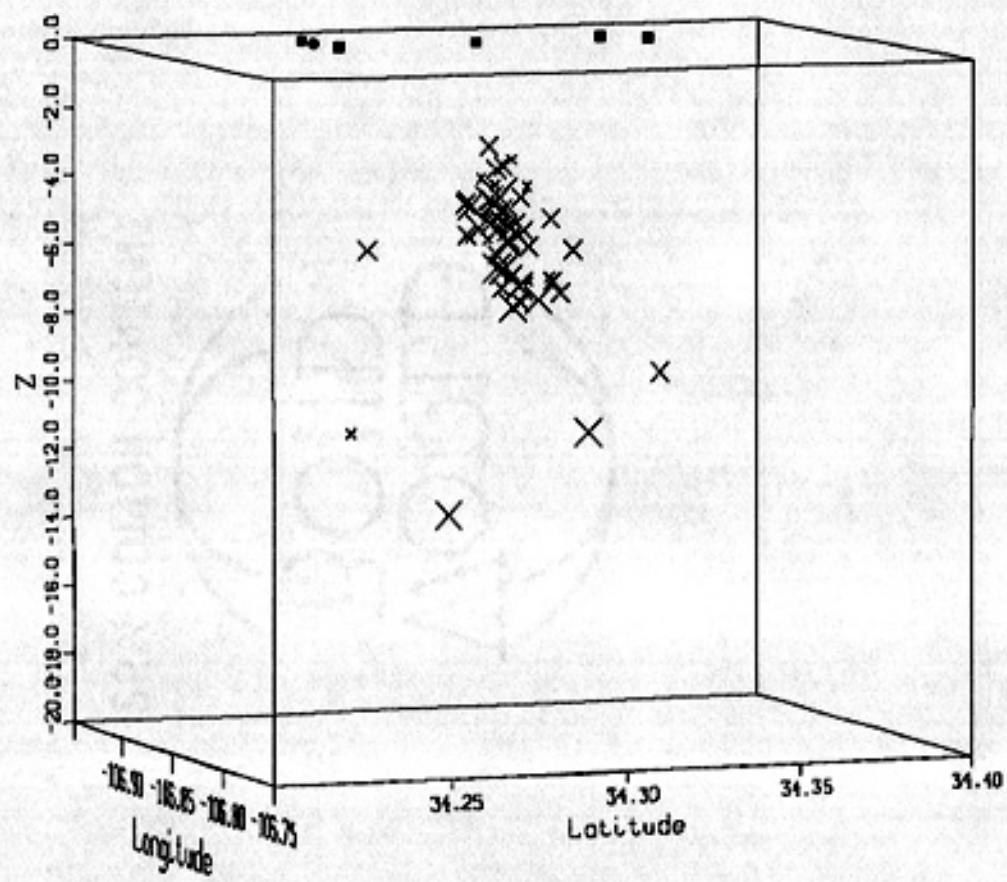
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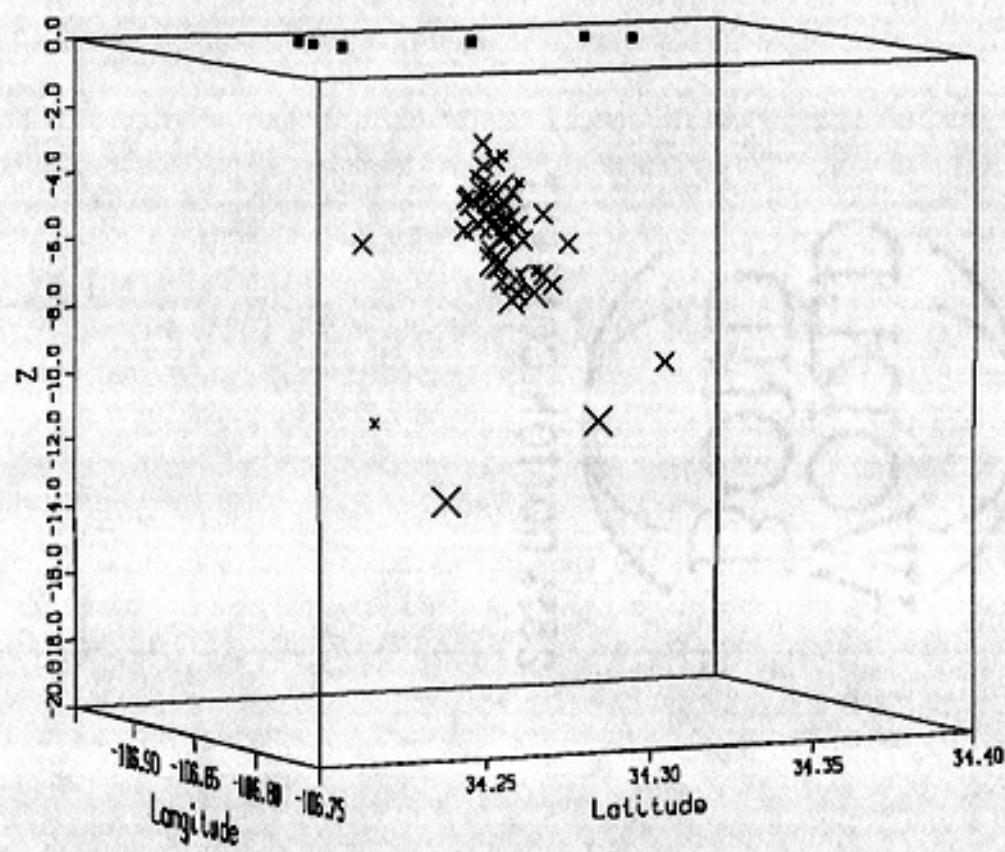
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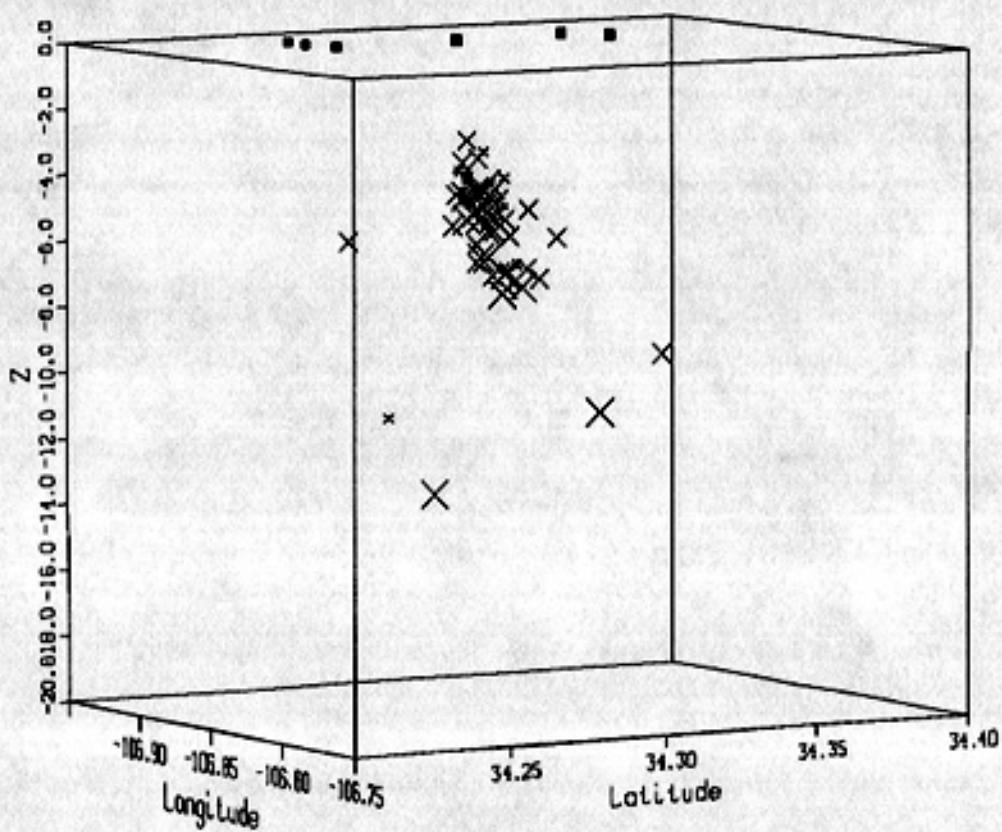
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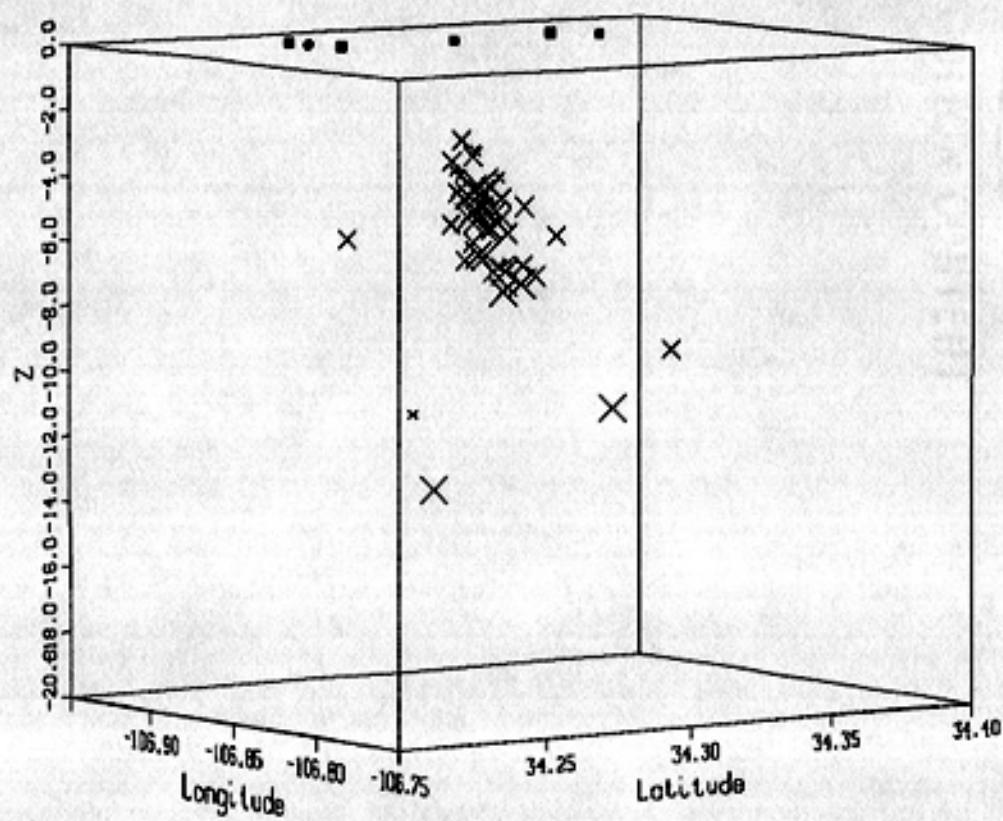
Precise events at -4D
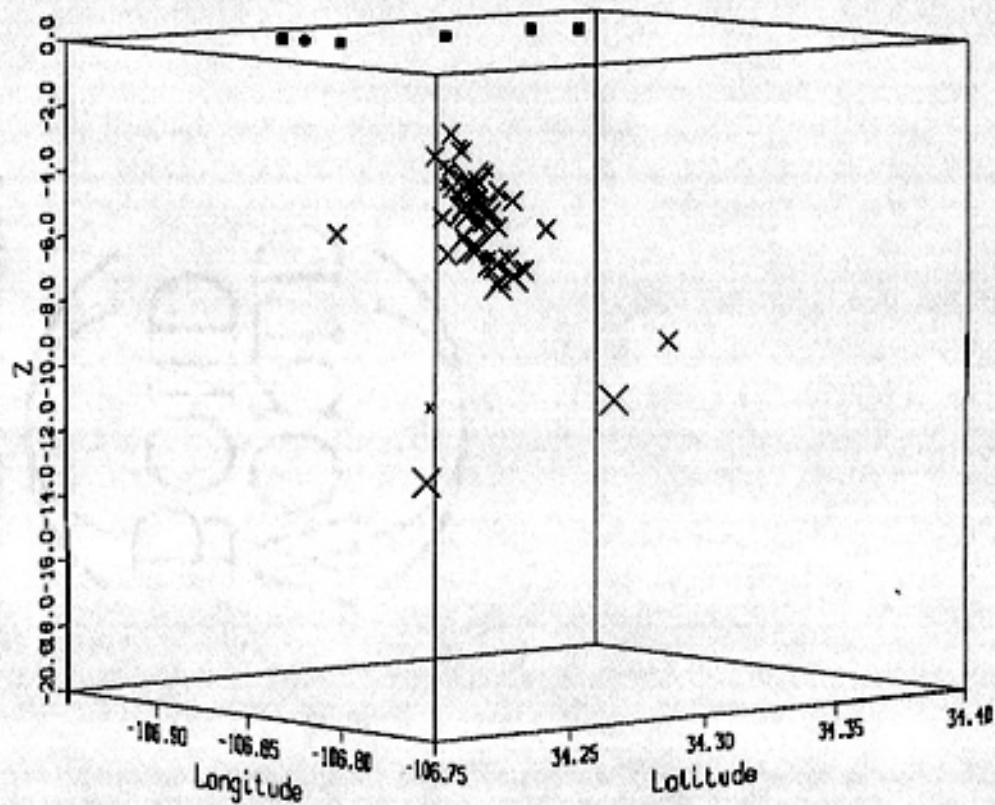
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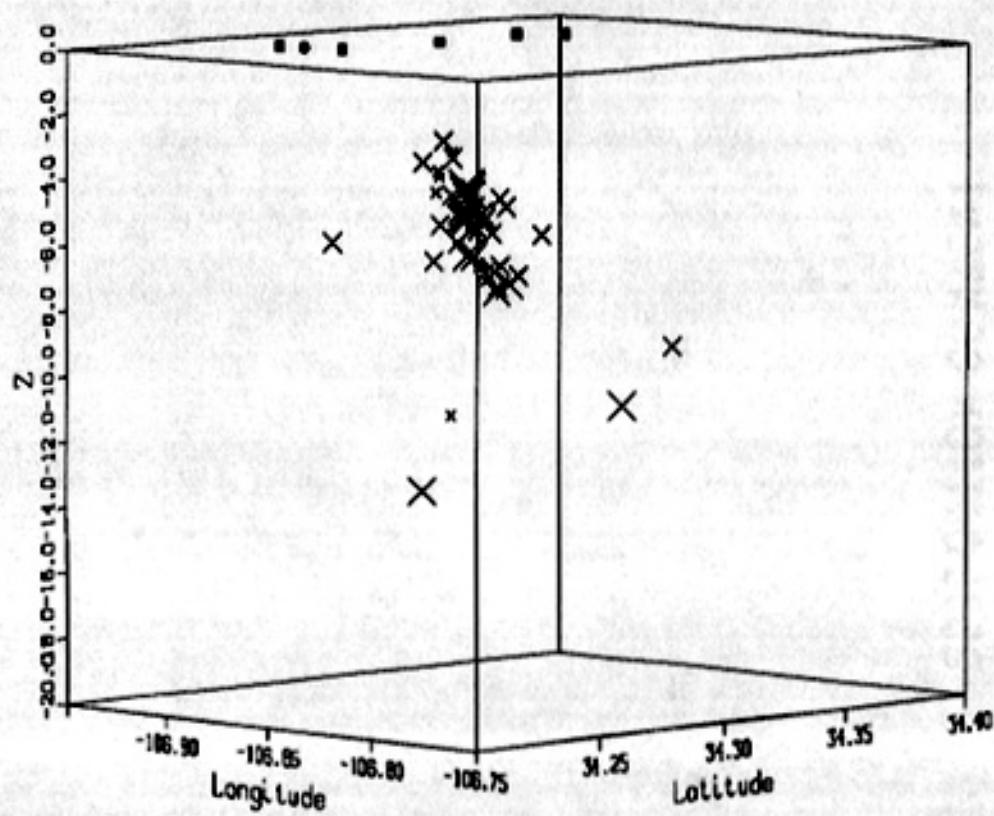
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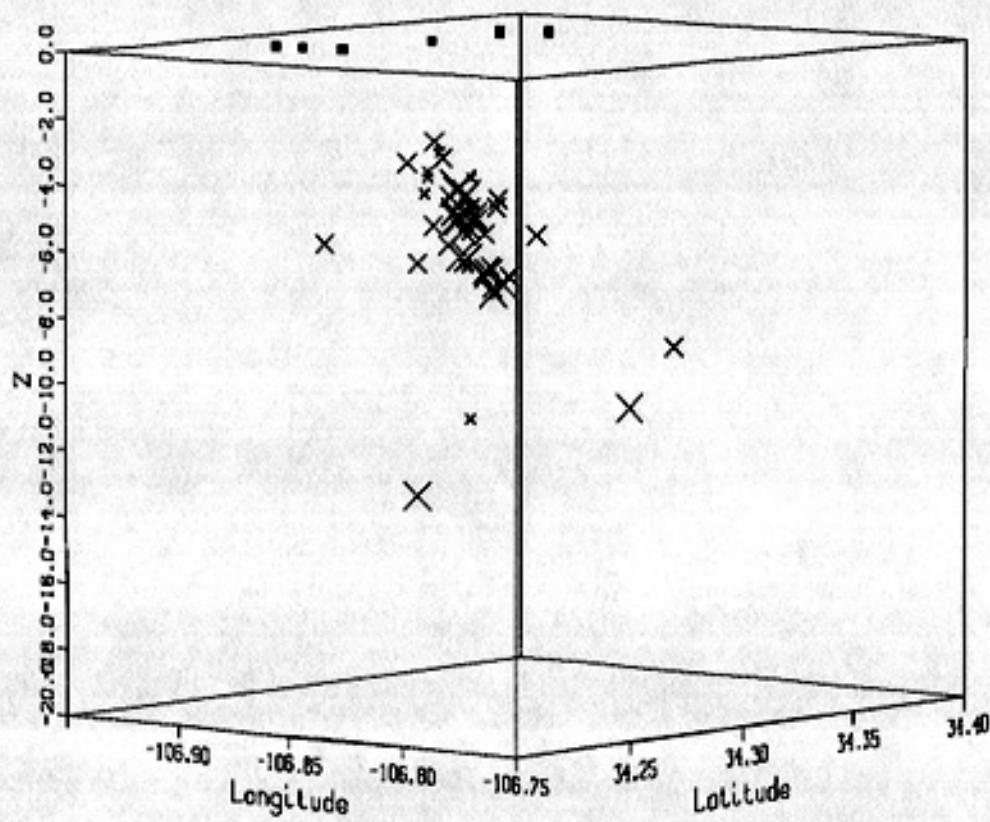
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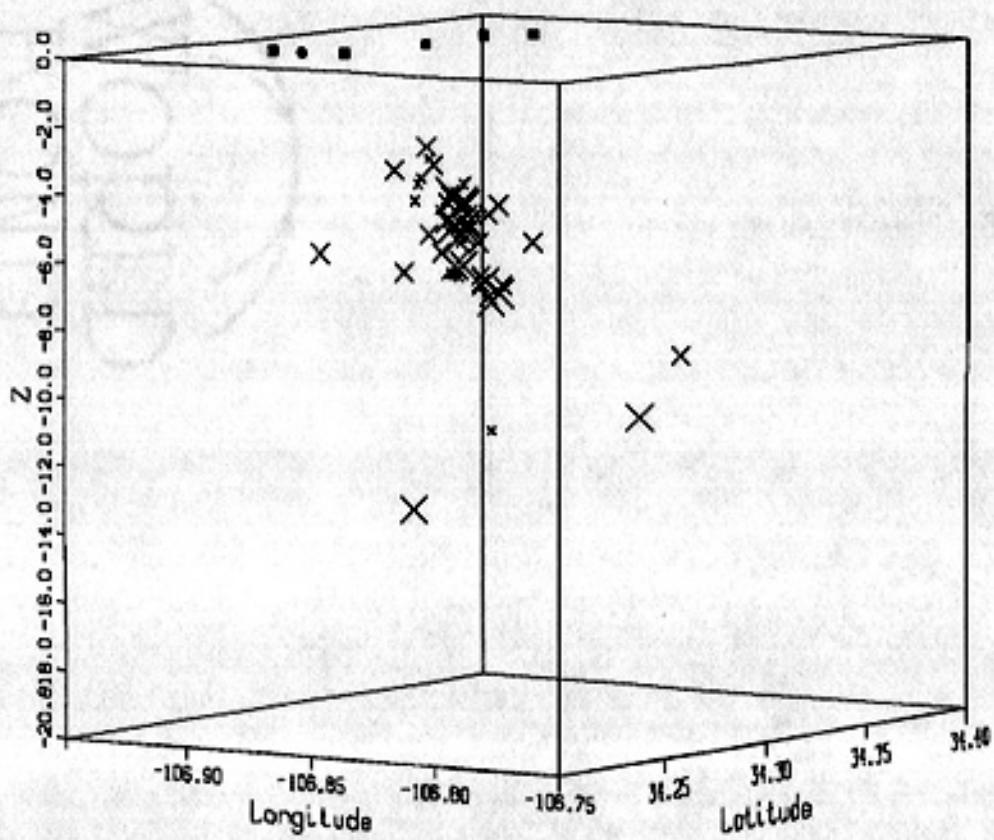
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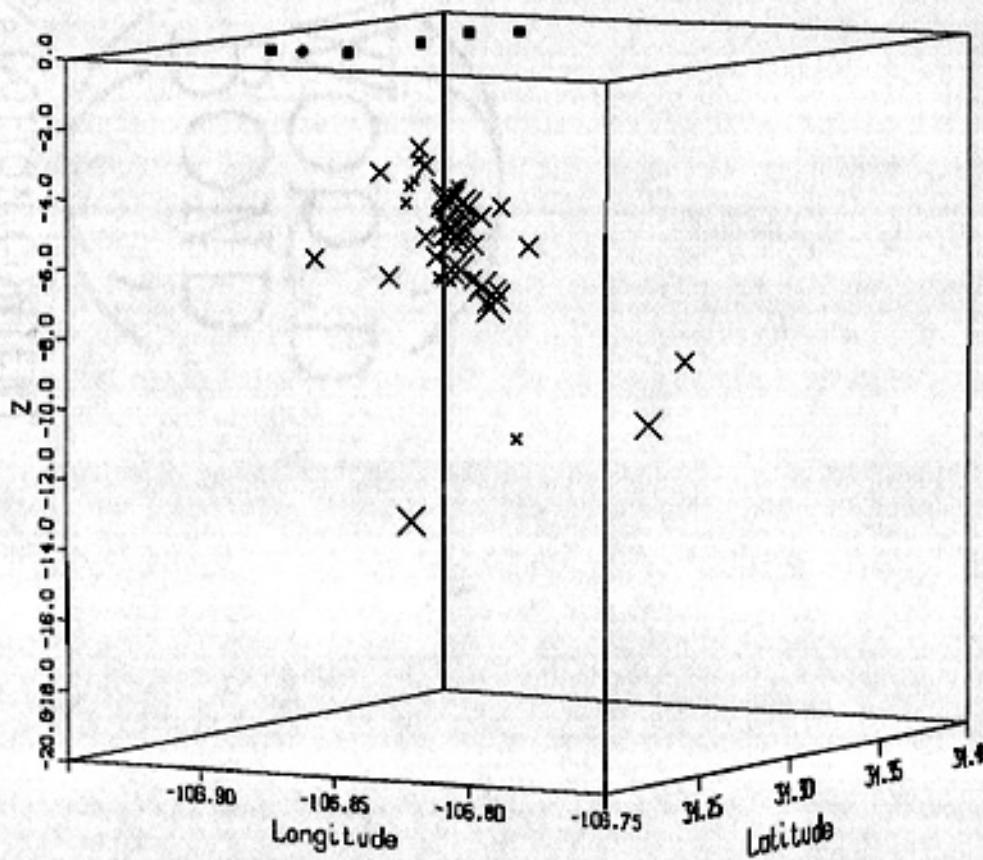
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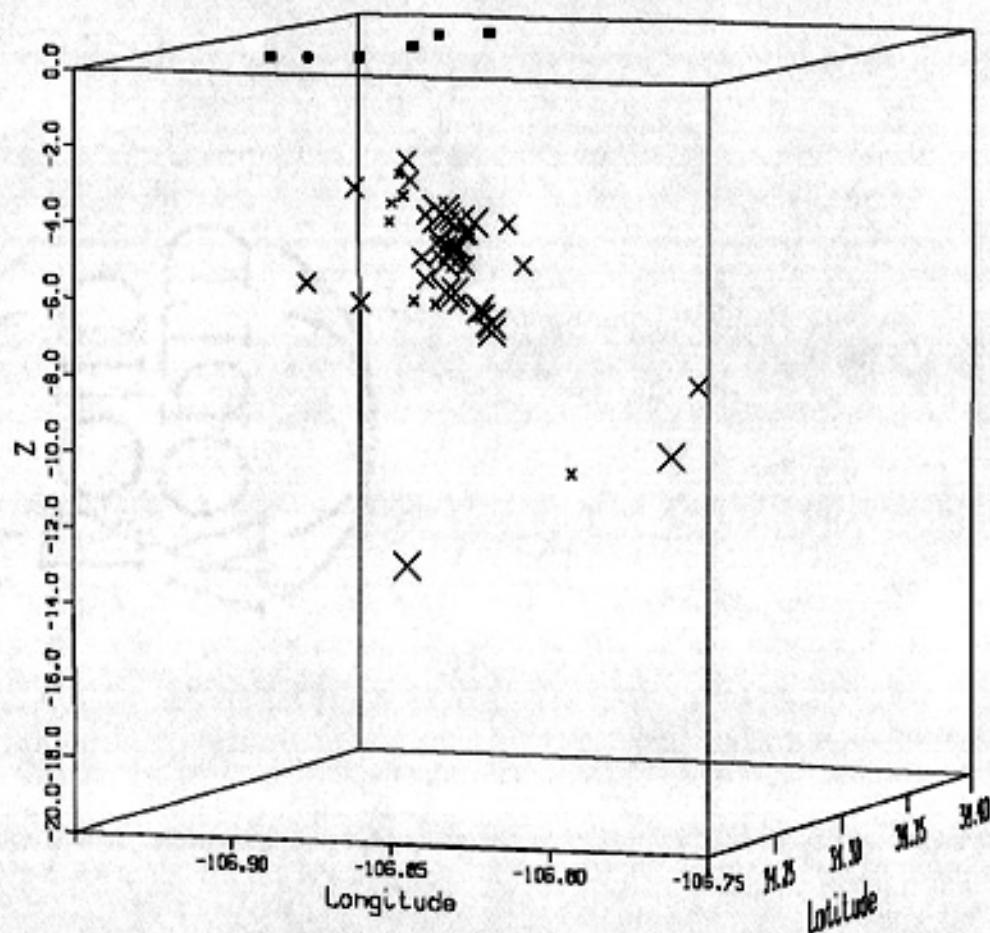
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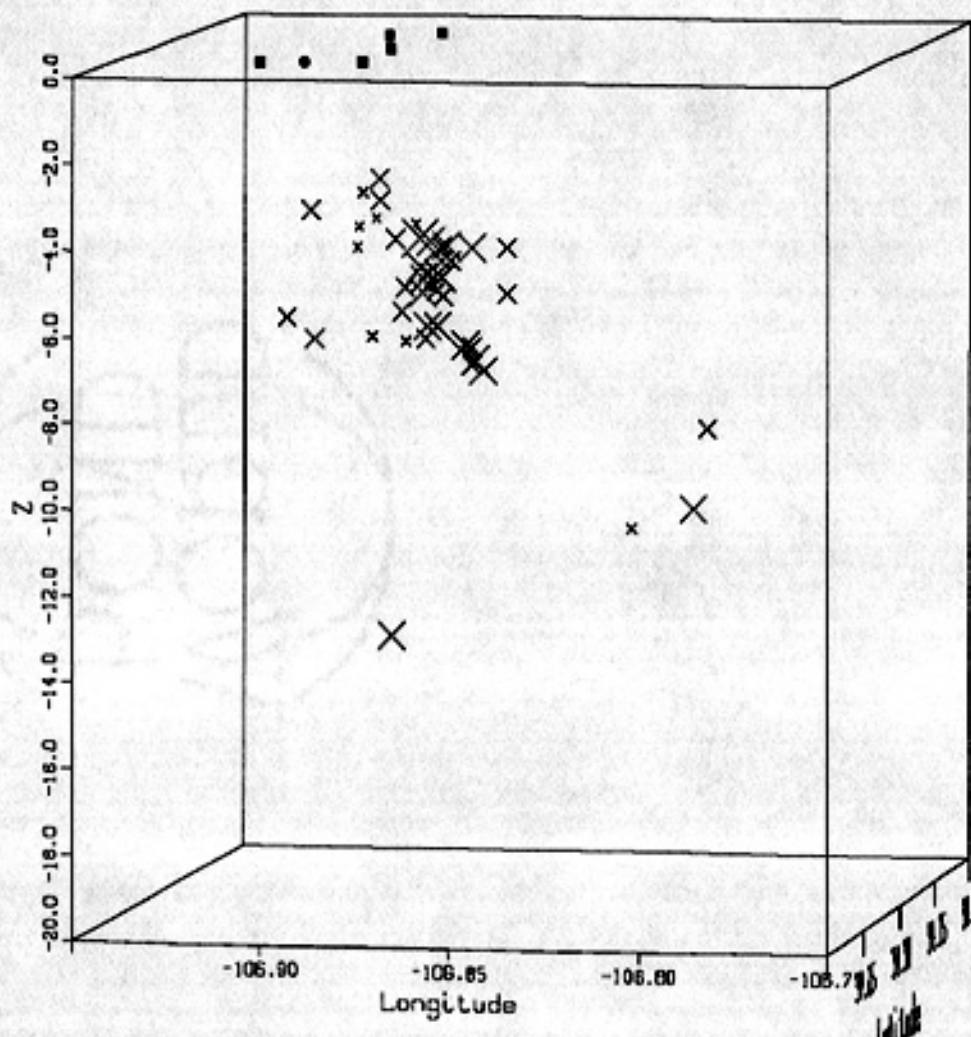
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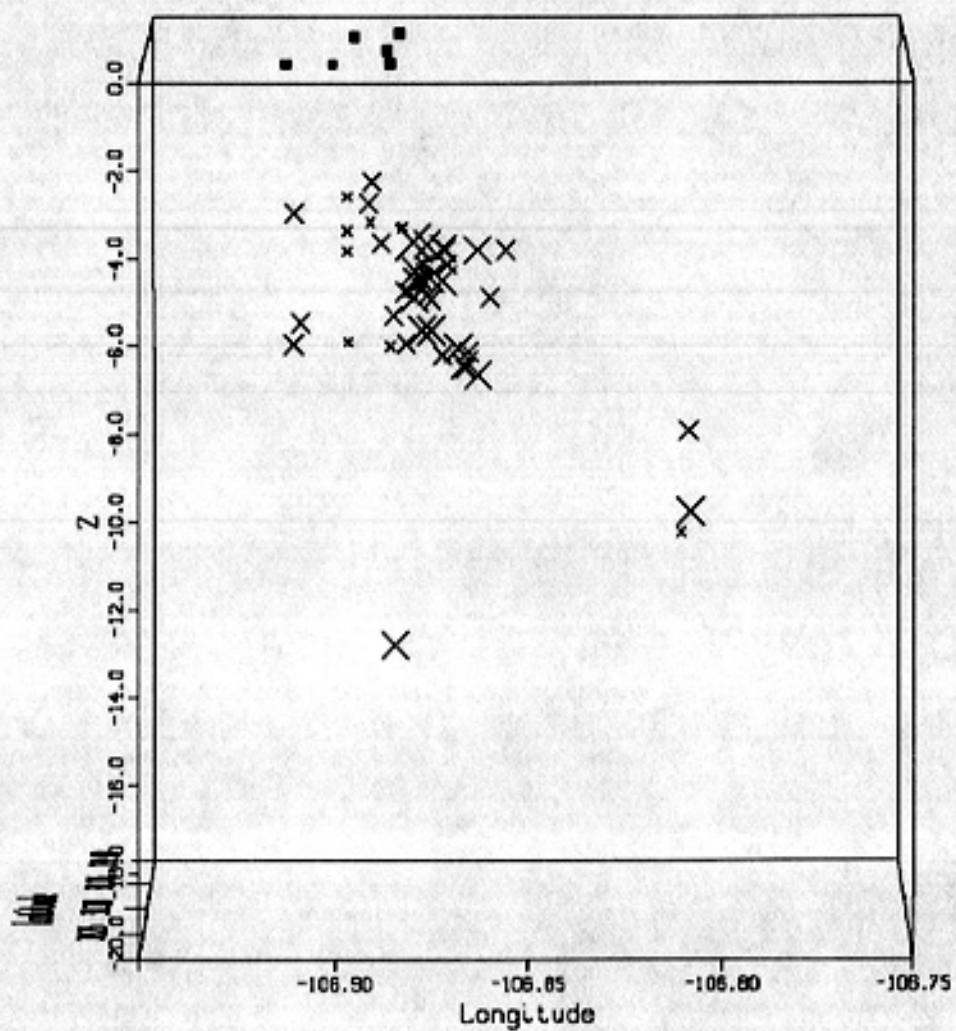
3-D plots of the A quality hypocenters
(symbols are increasing with magnitude)

AAA Quality Hypocenters at 90
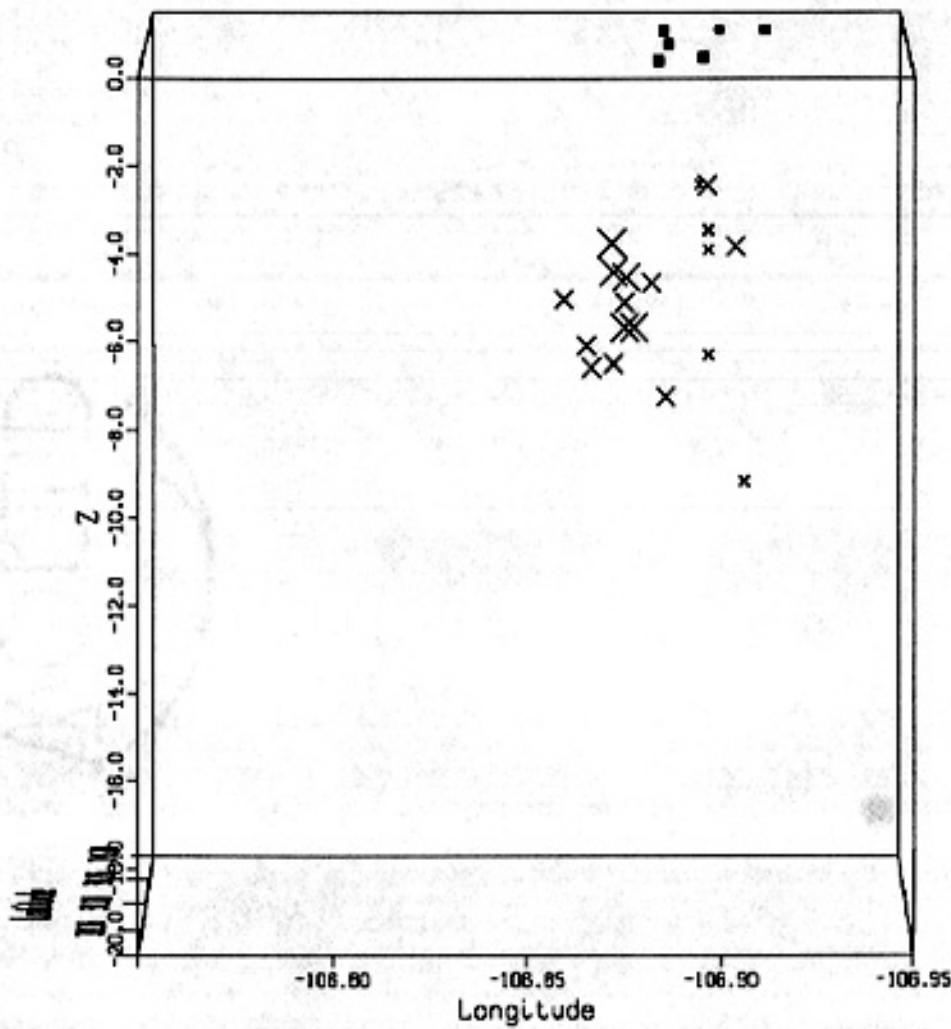
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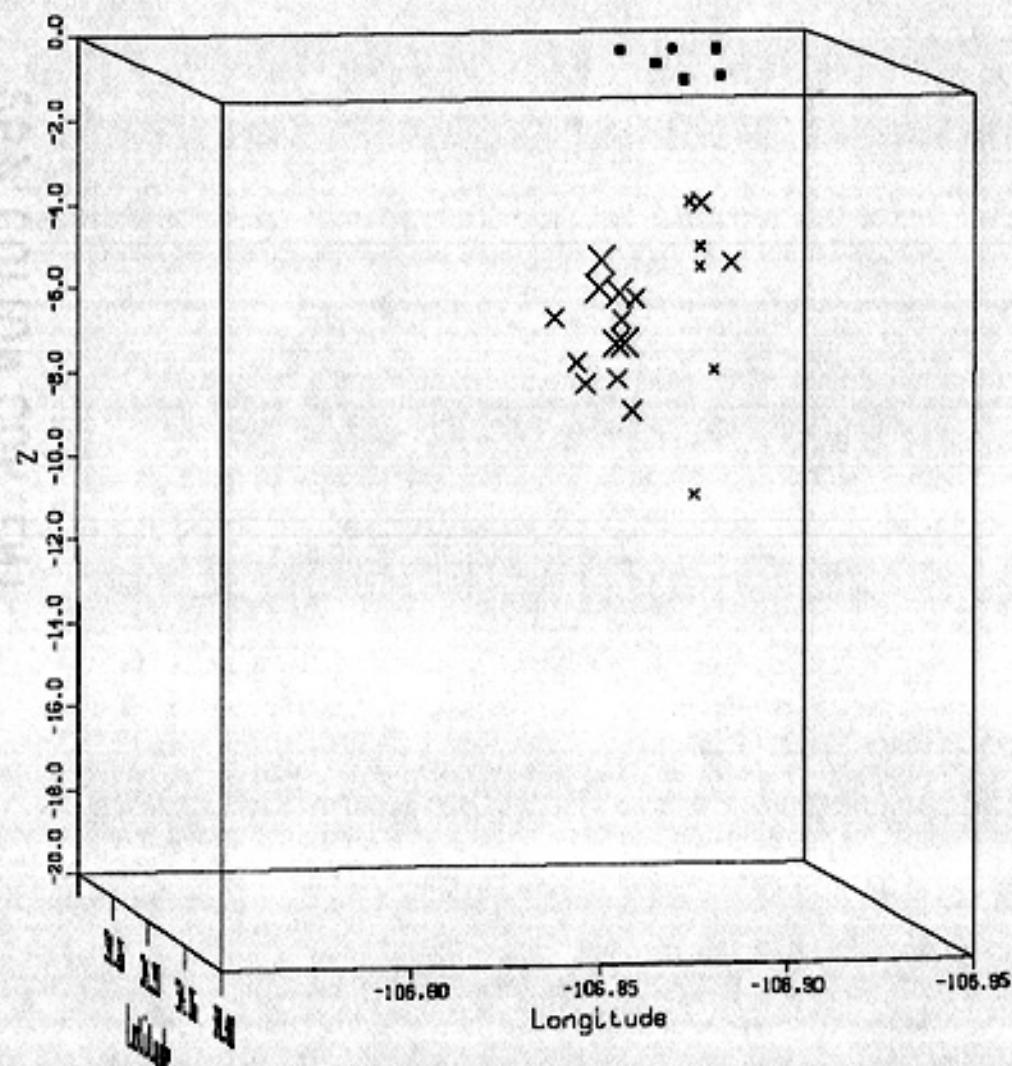
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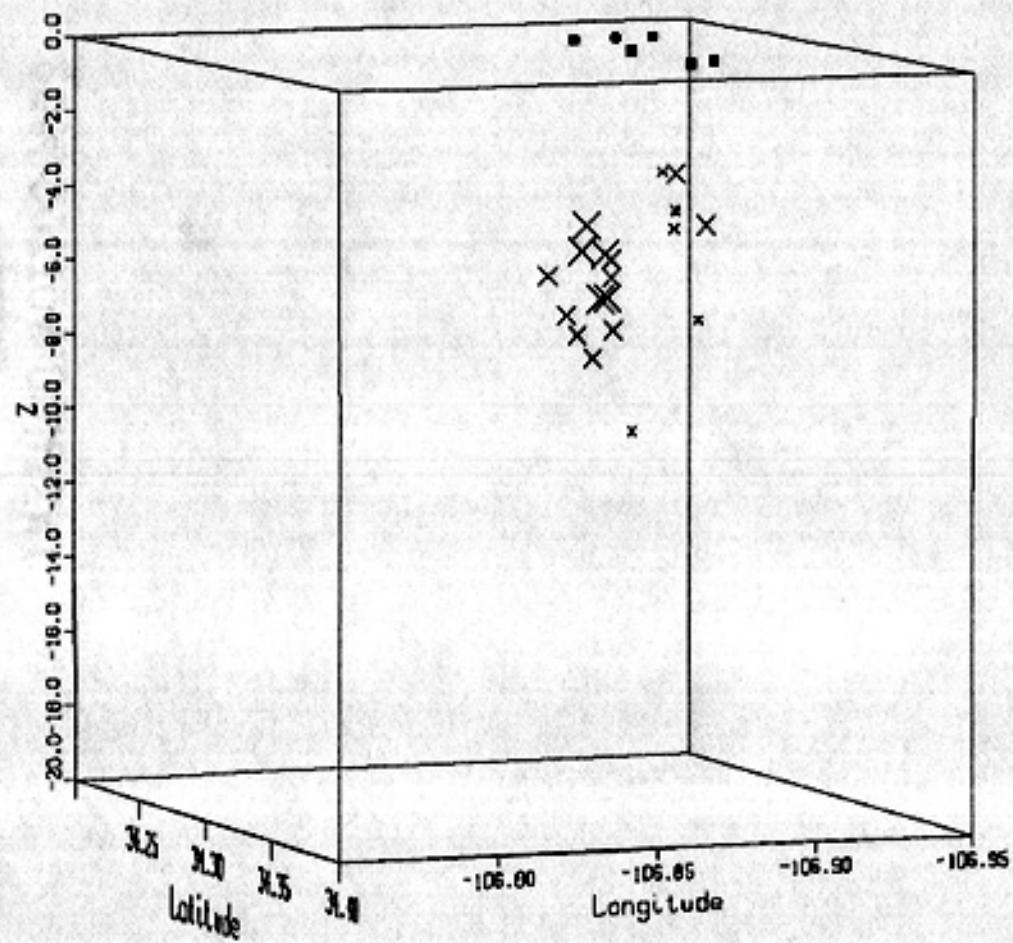
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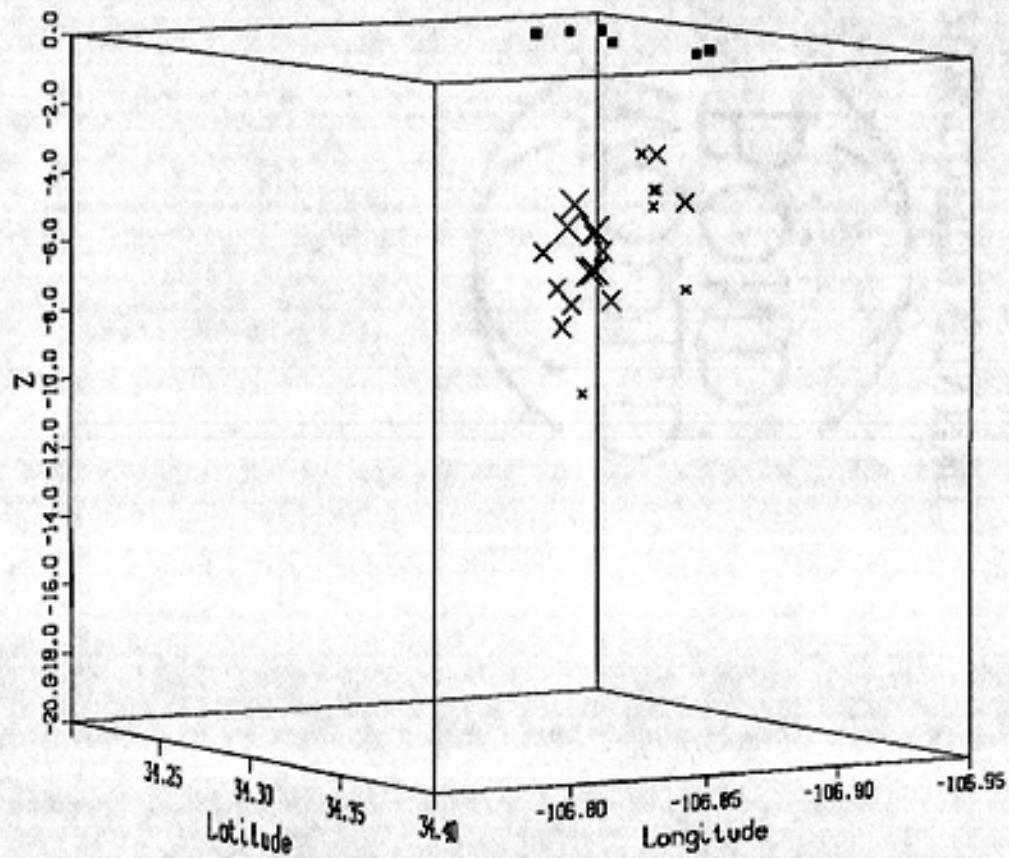
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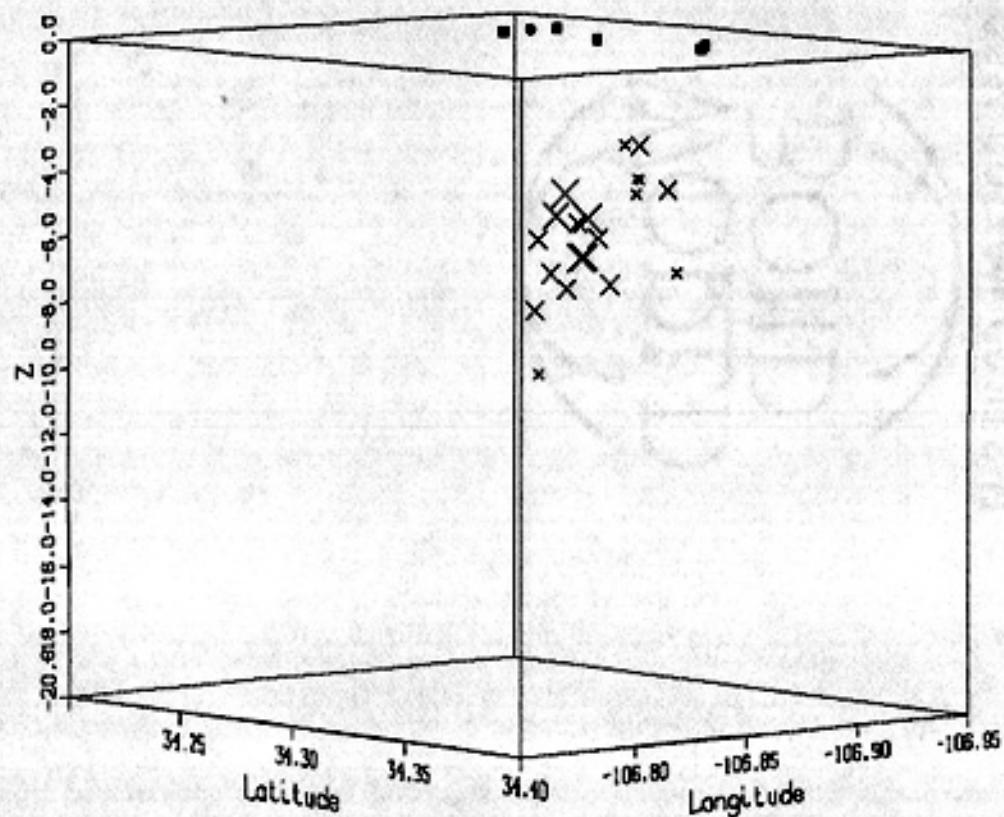
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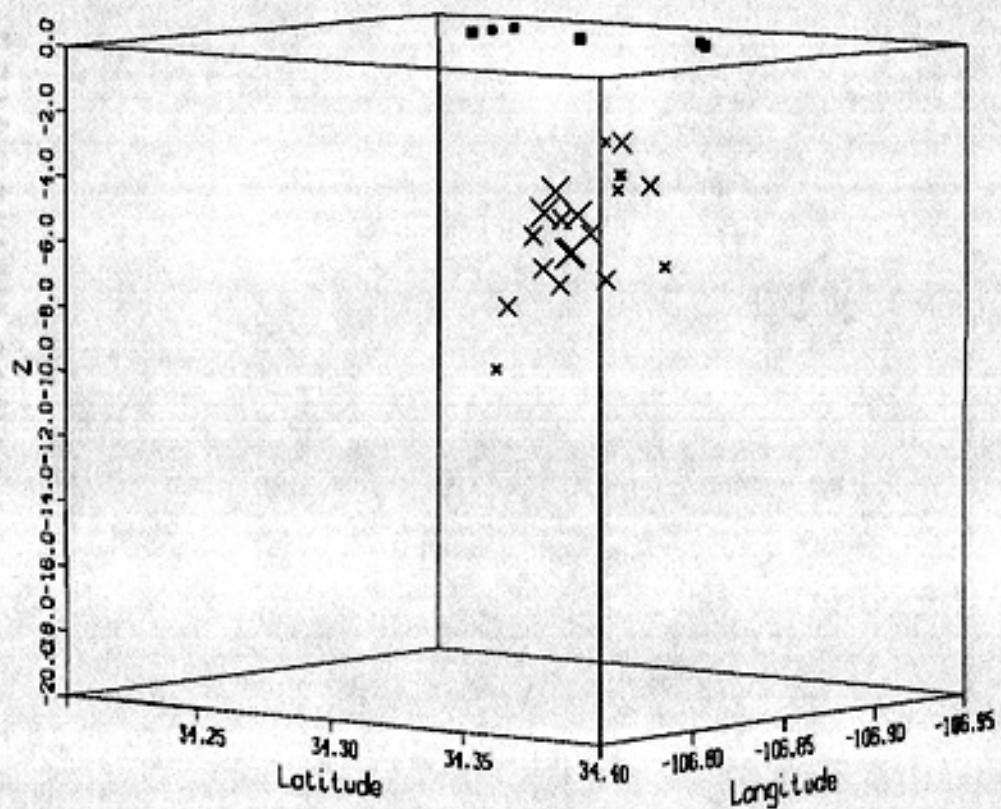
AAA Quality Events at 30
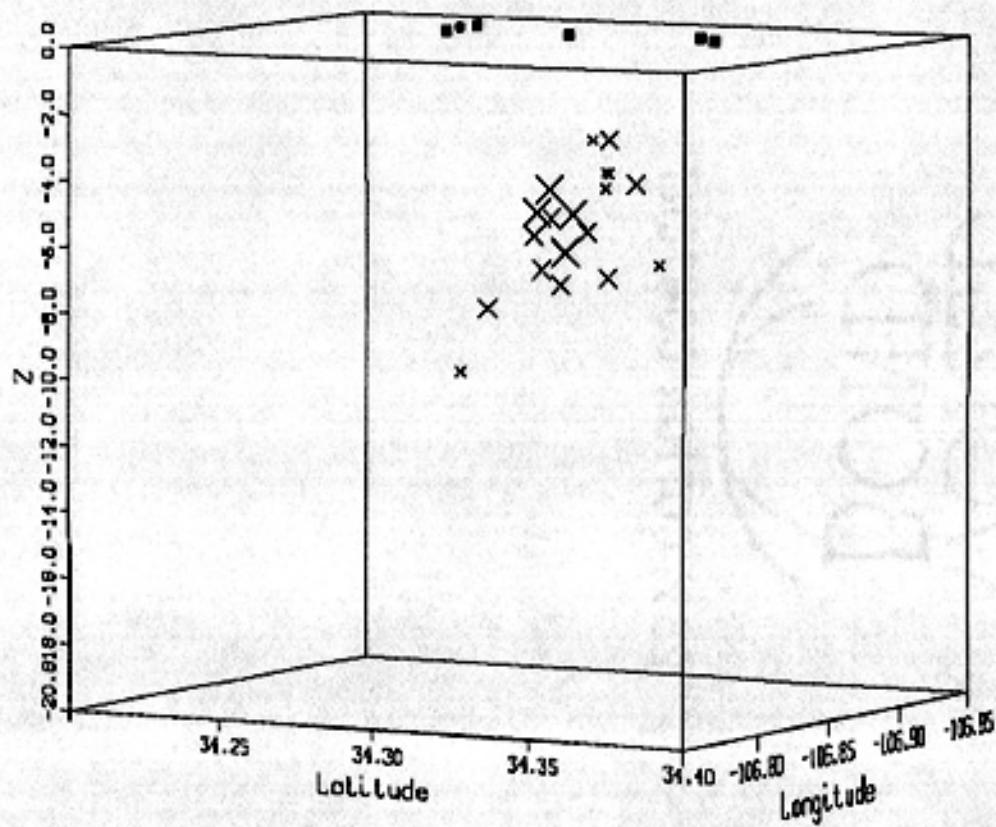
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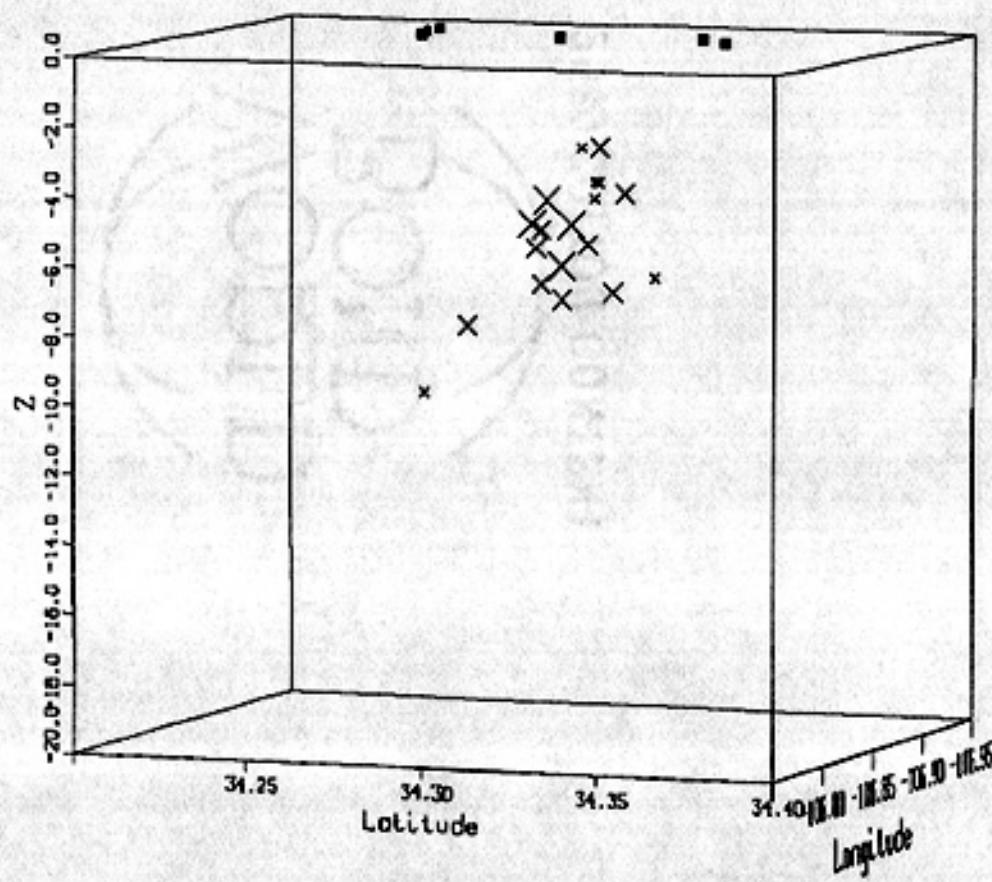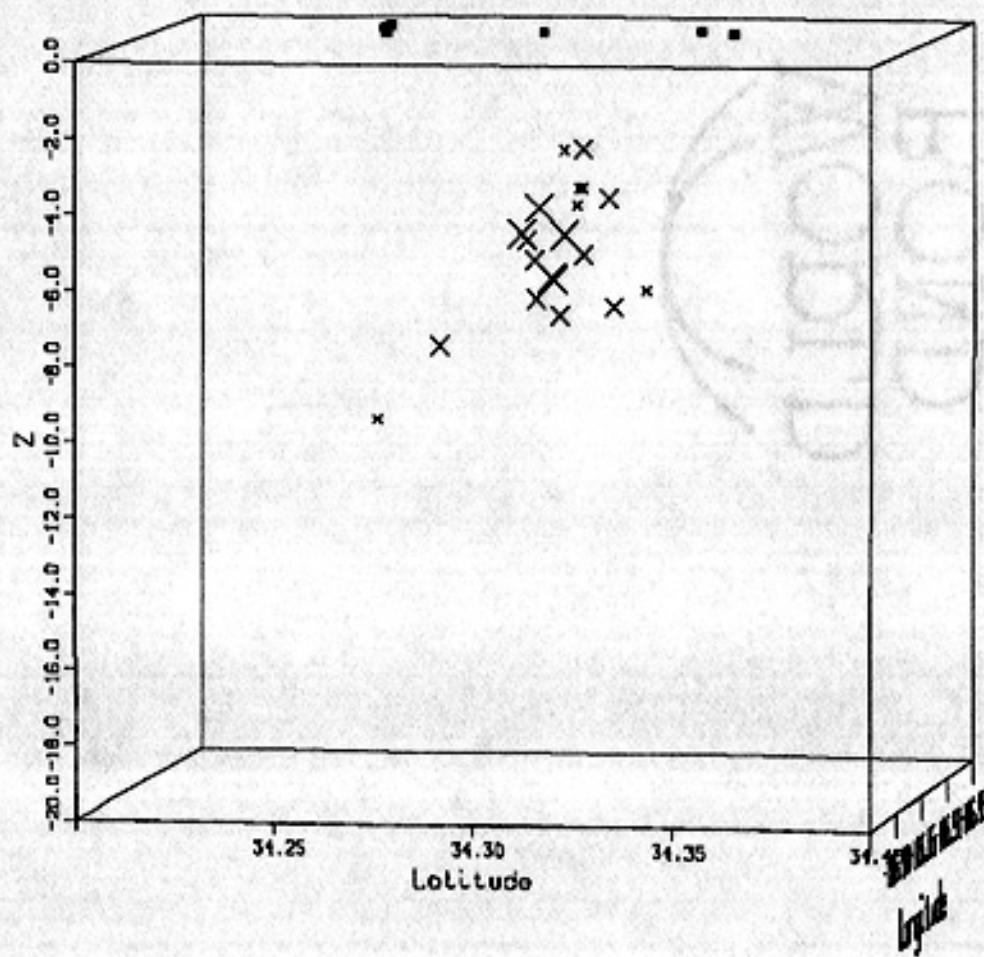
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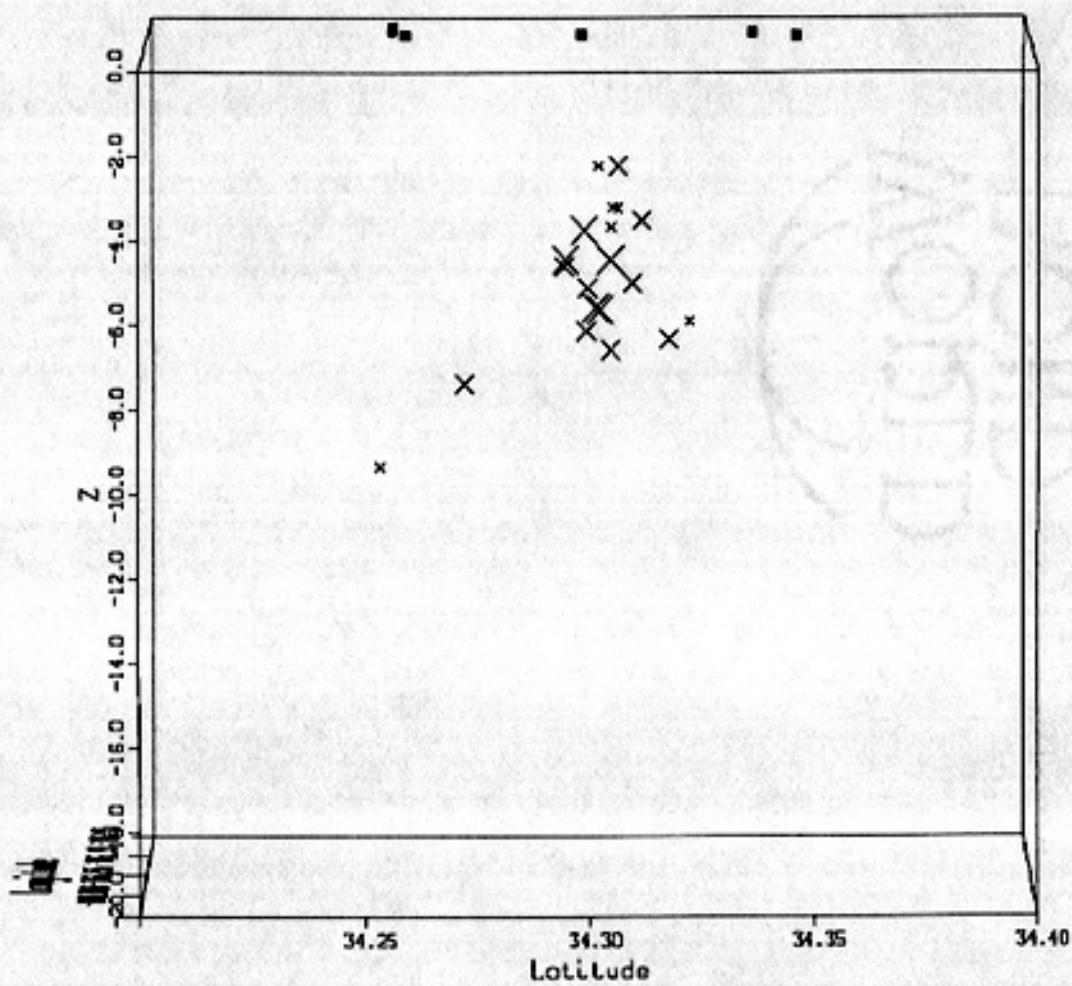
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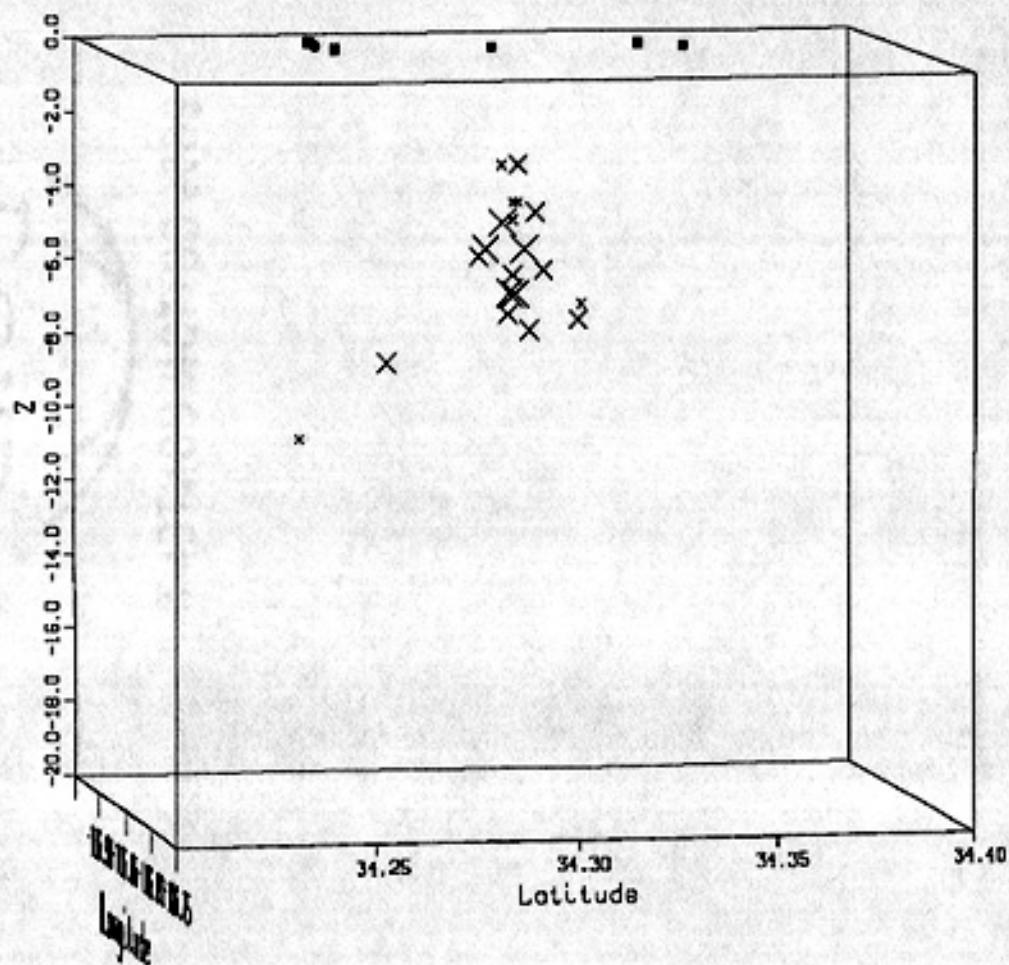
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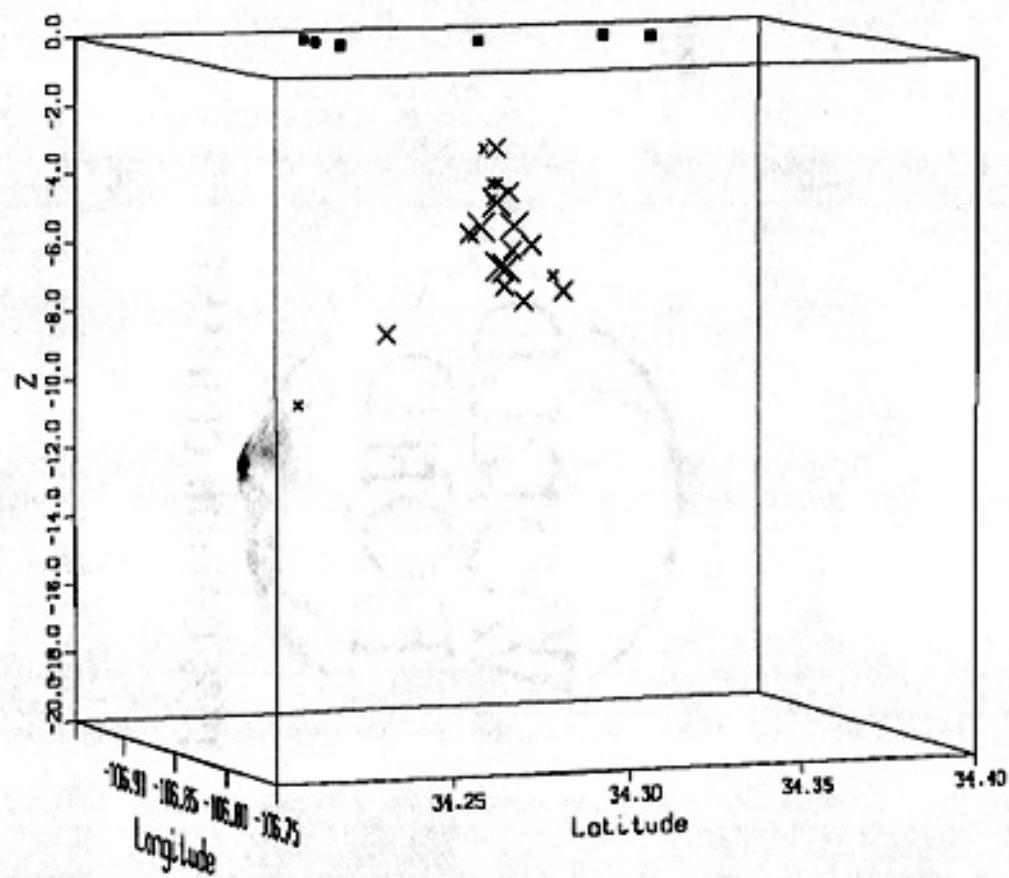
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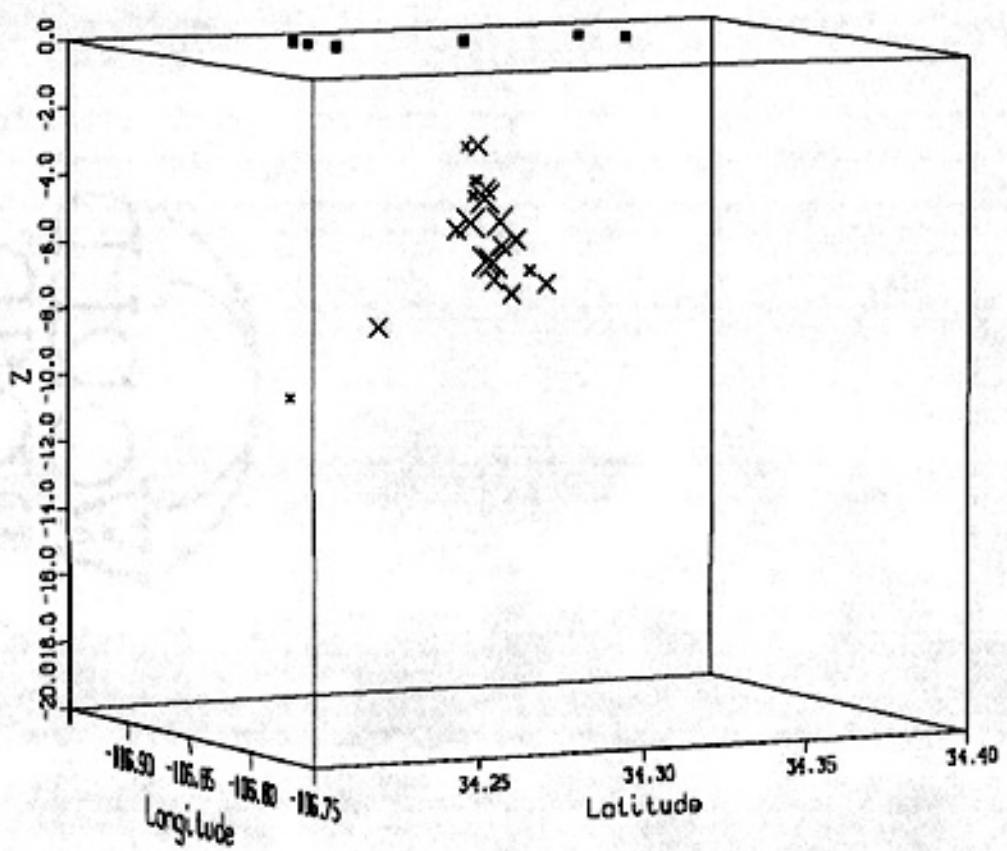
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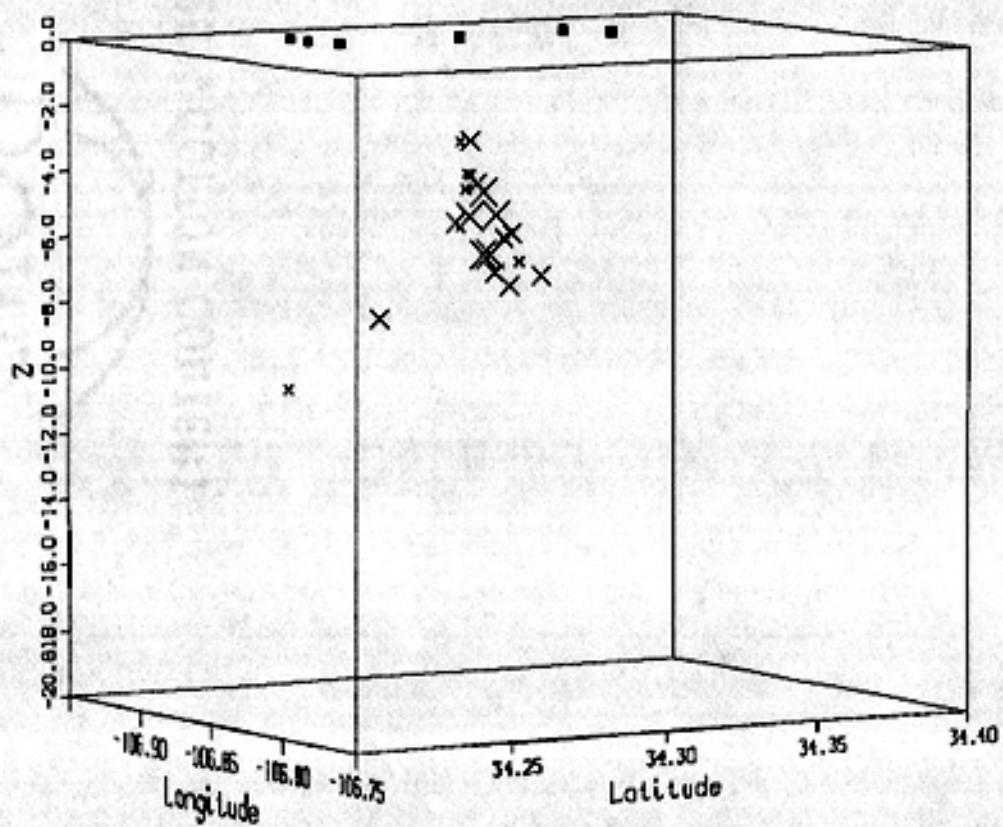
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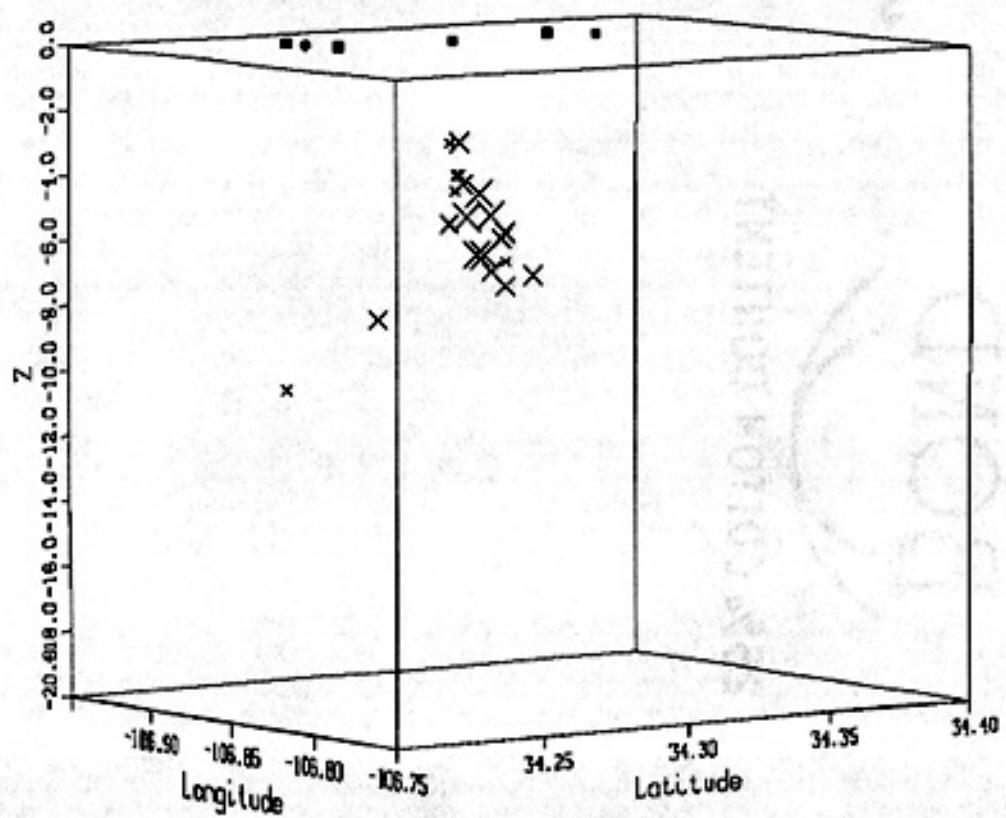
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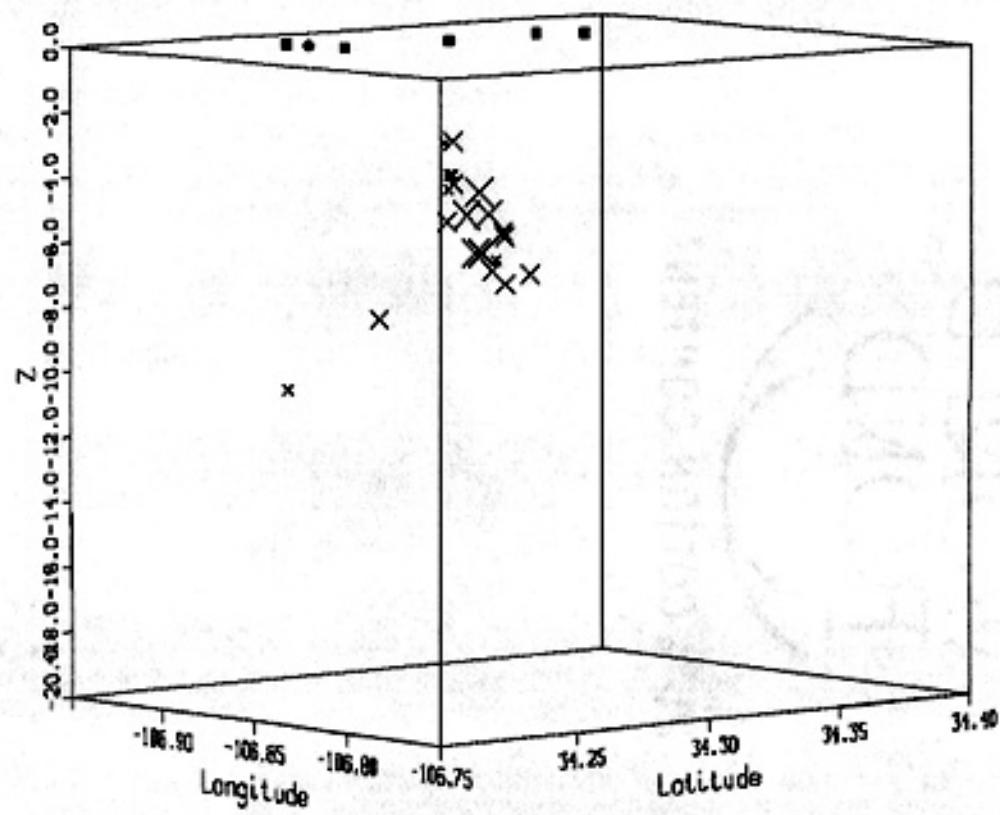
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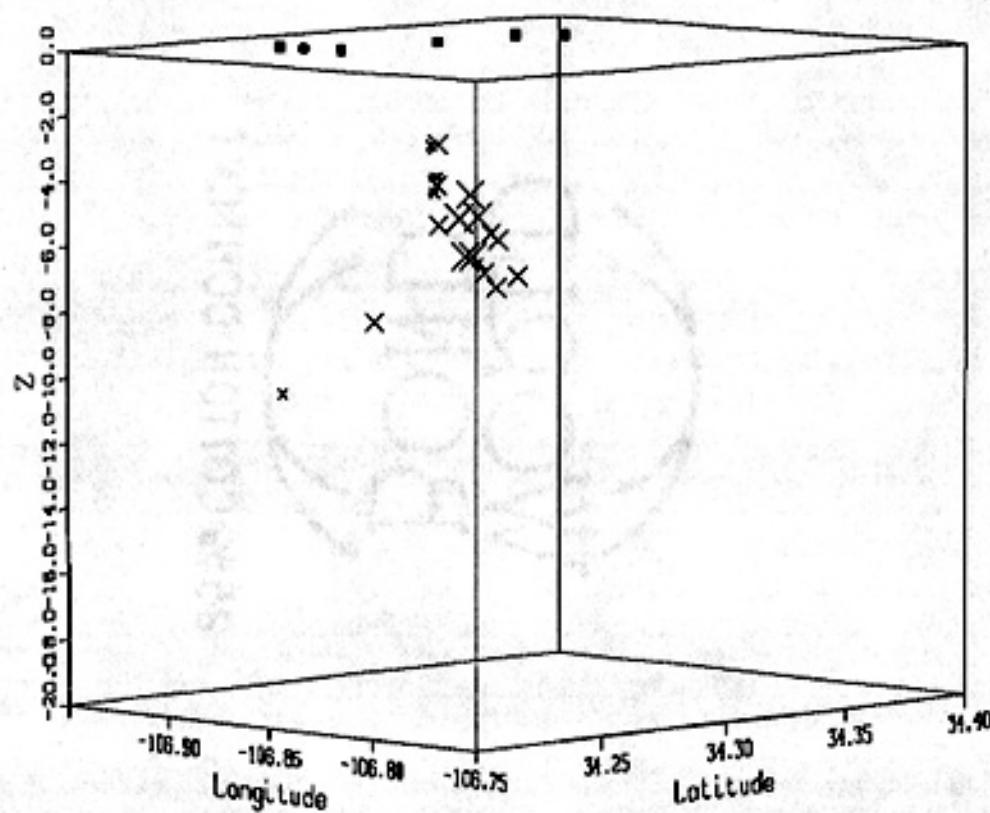
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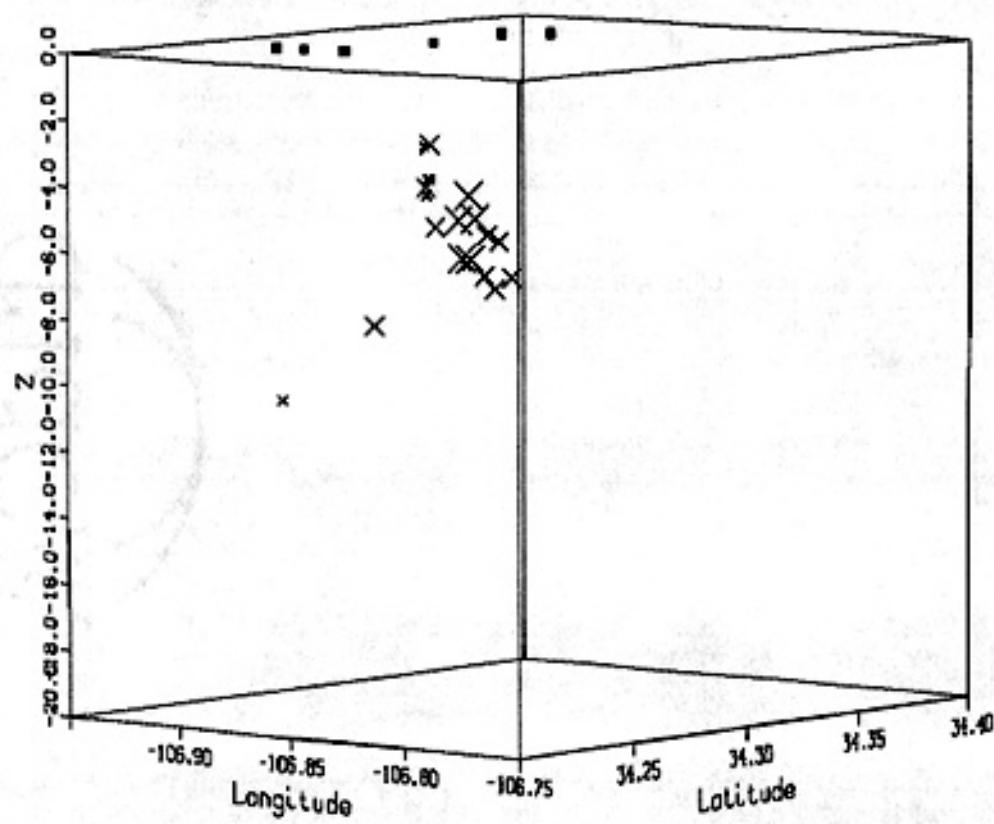
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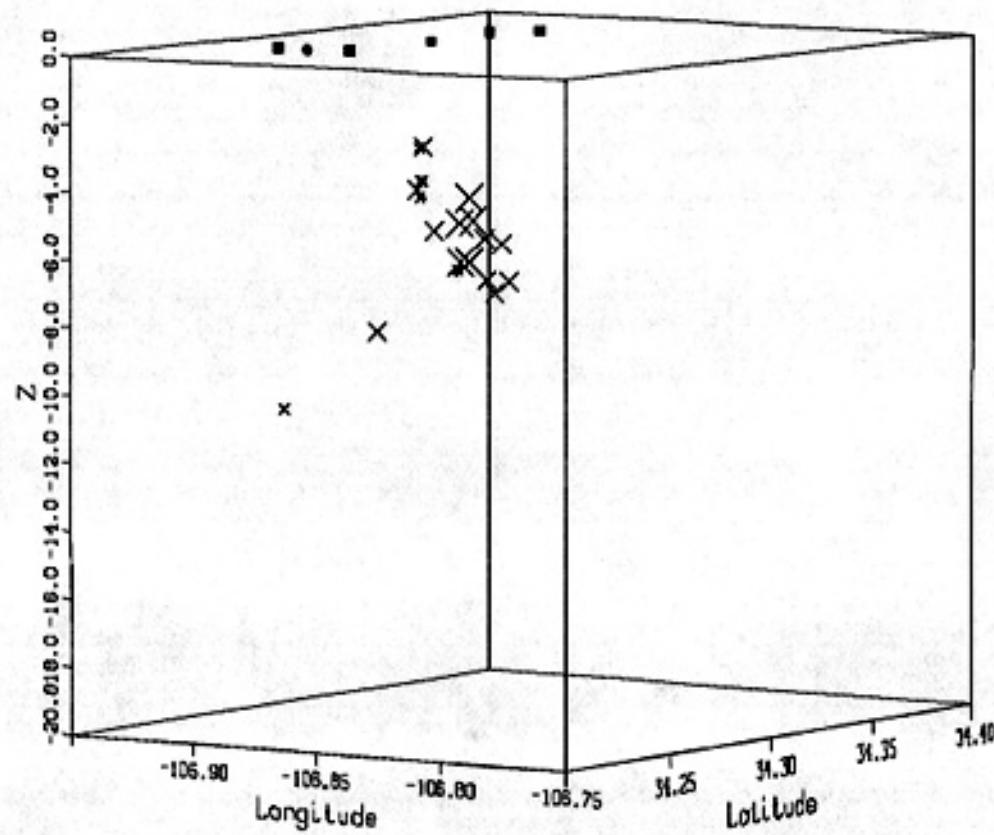
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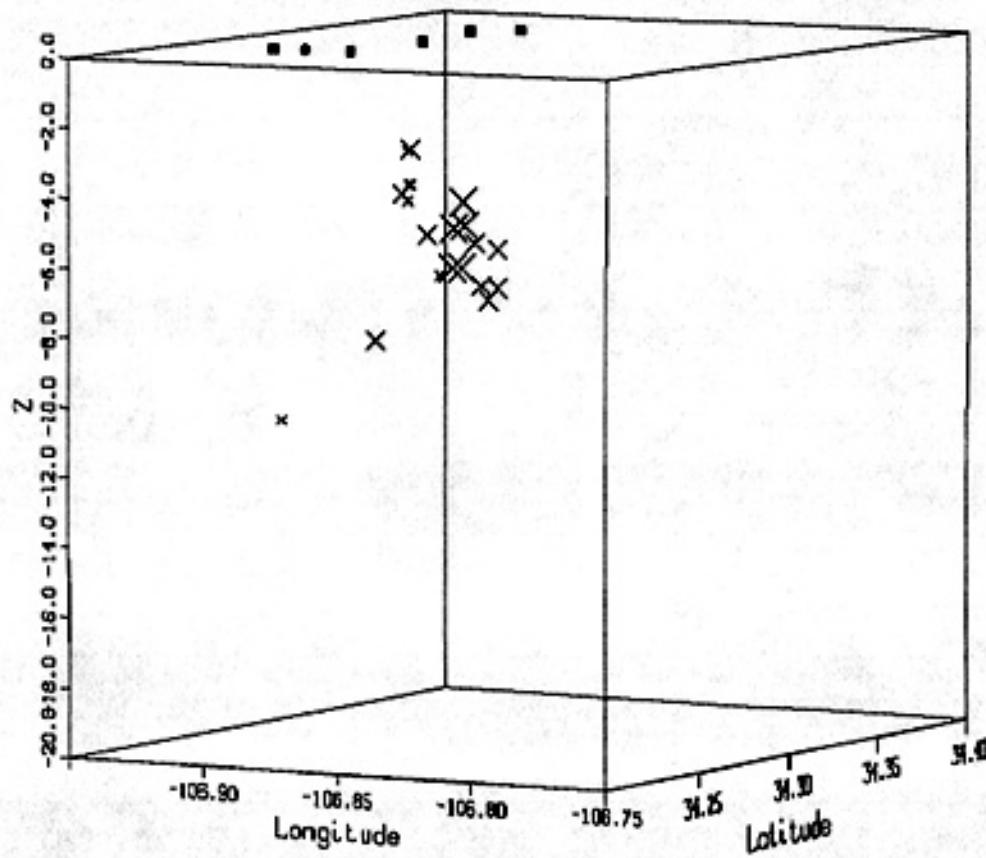
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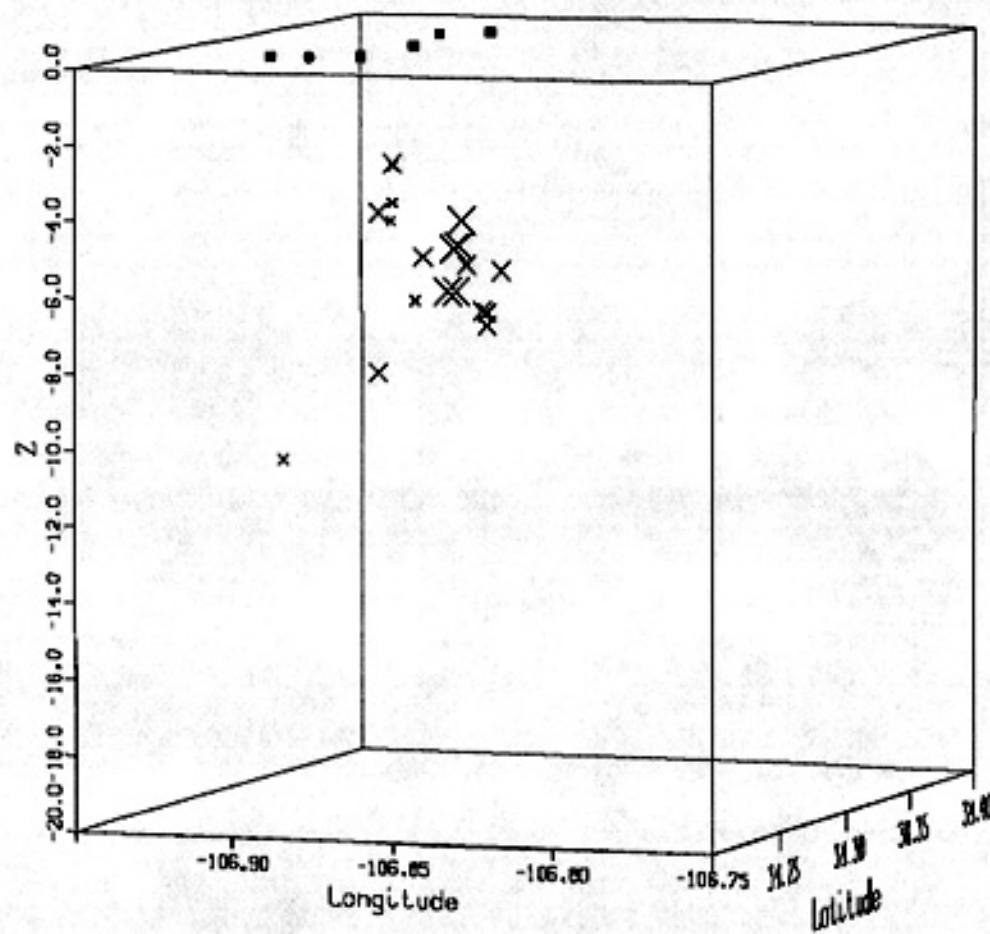
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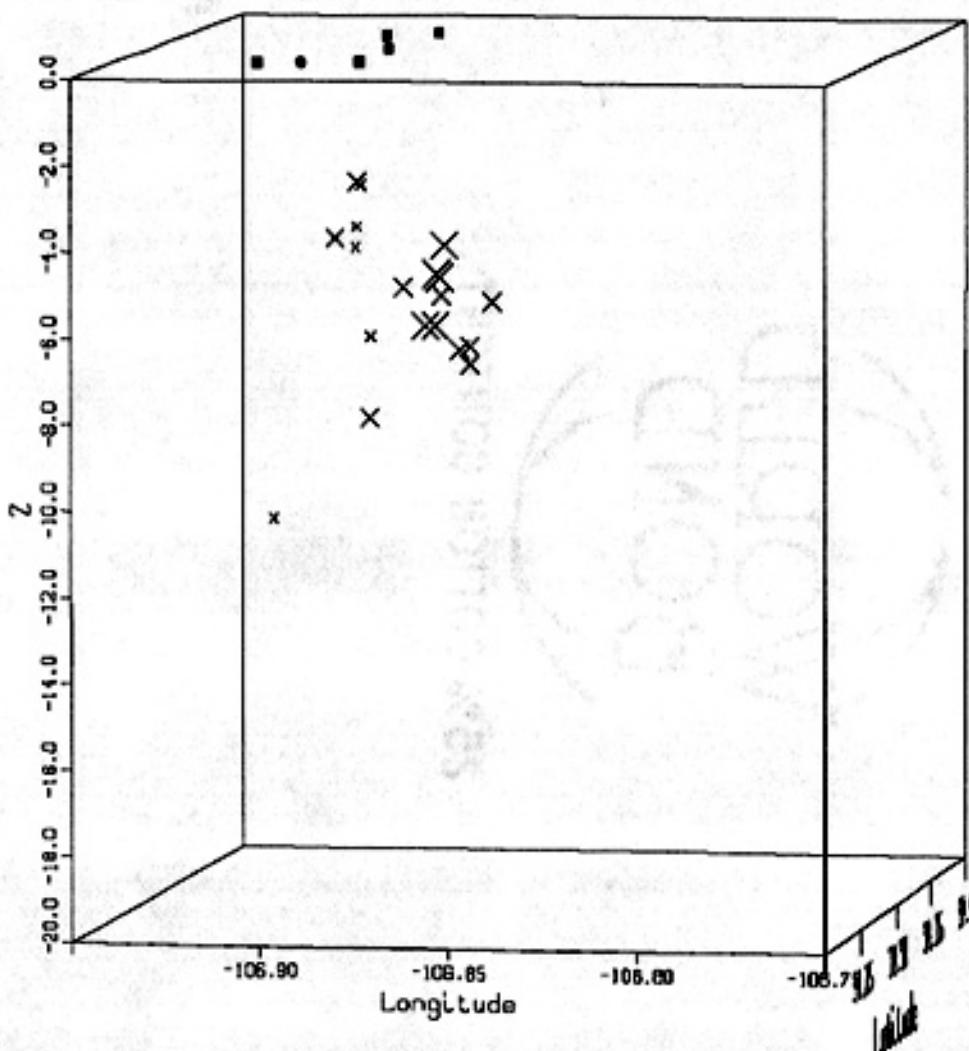
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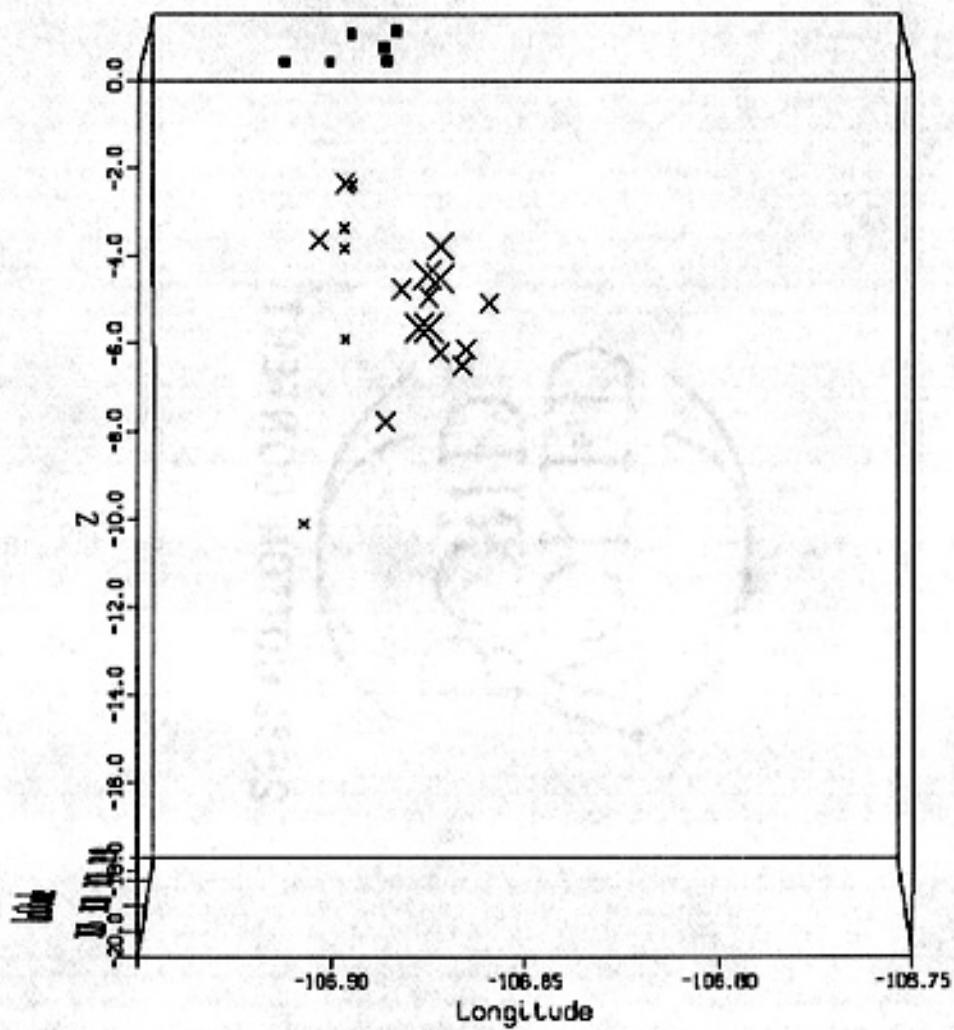
3-D plots of the Mag. > 1.0 hypocenters

(symbols are increasing with magnitude)

Events of Mag. > 1.0 at 8D
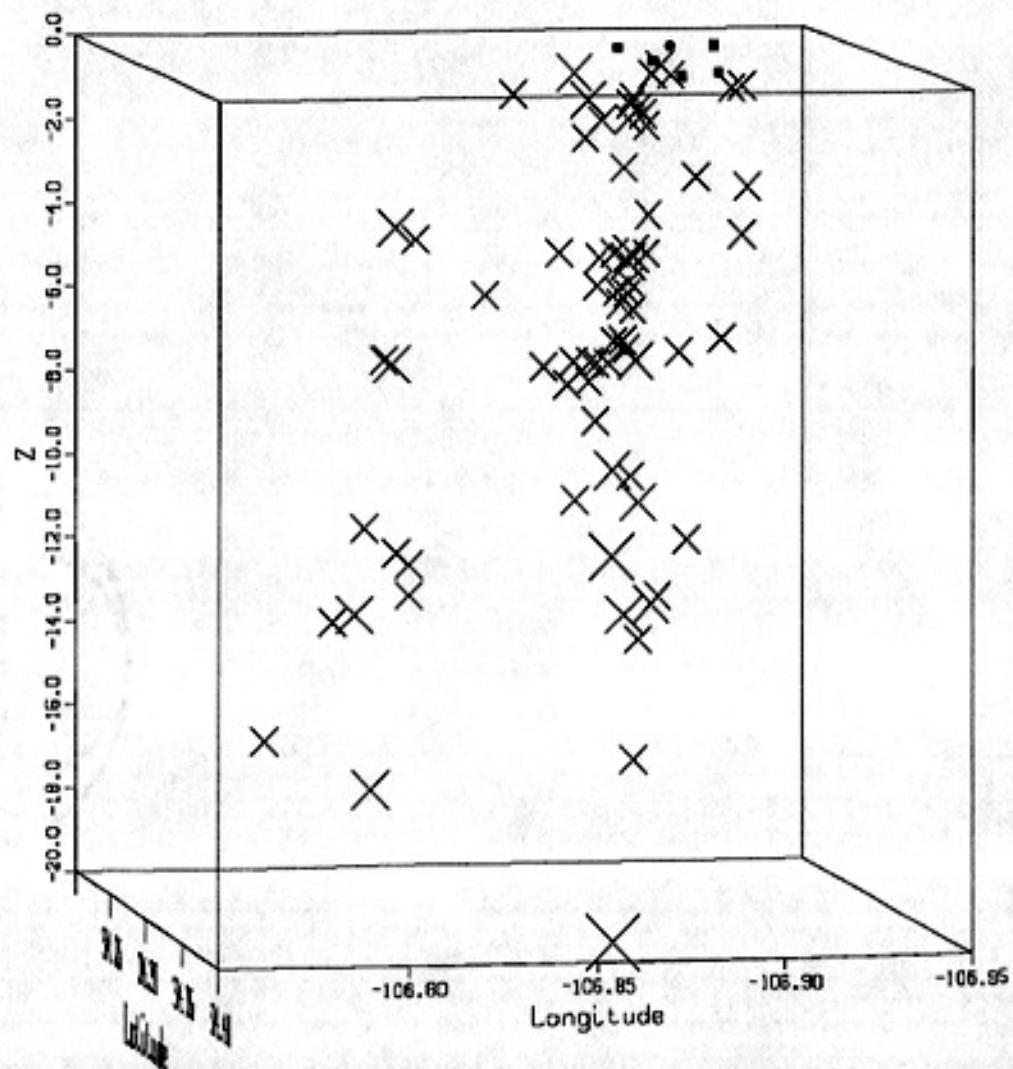
Events of Mag. > 1.0 at 70

Events of Mag. > 1.0 at 60

Events of Mag. > 1.0 at 50

Events of Mag. > 1.0 at 40

Events of Mag. > 1.0 at 30

Events of Mag. > 1.0 at 20

Events of Mag. > 1.0 at 10

Events of Mag. > 1.0 at O

Events of Mag. > 1.0 at -10

Events of Mag. > 1.0 at -20

Events of Mag. > 1.0 at -30

Events of Mag. > 1.0 at -40

Events of Mag. > 1.0 at -50

Events of Mag. > 1.0 at -60

Events of Mag. > 1.0 at -70

Events of Mag. > 1.0 at -80
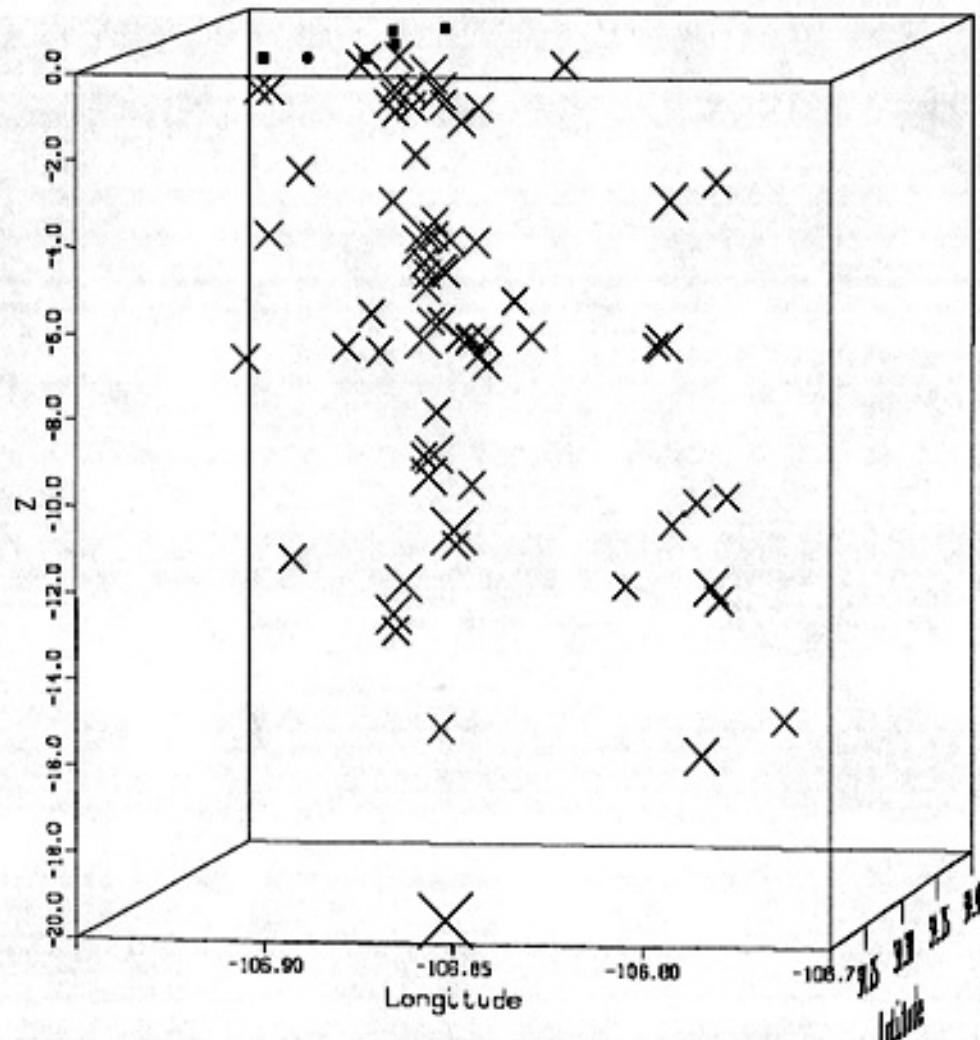
Events of Mag. > 1.0 at -90
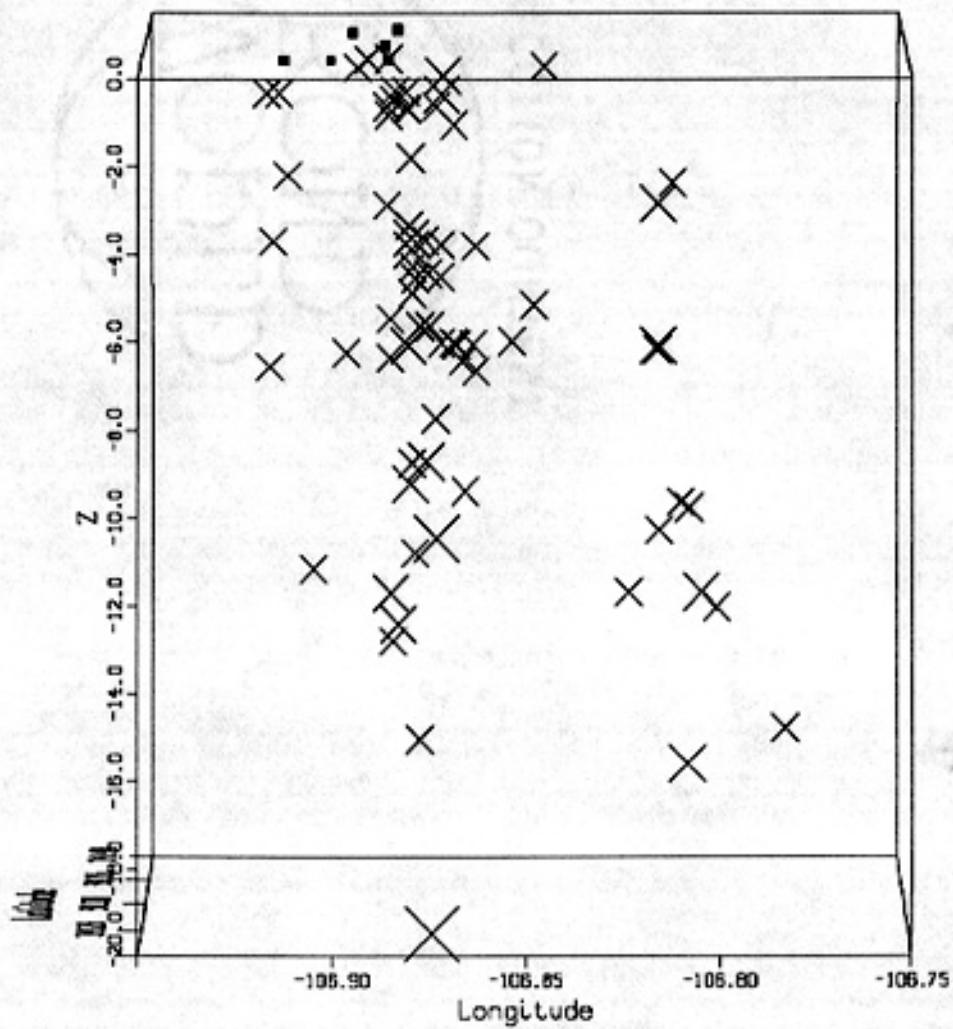
Events of Md > 1.0 at 90
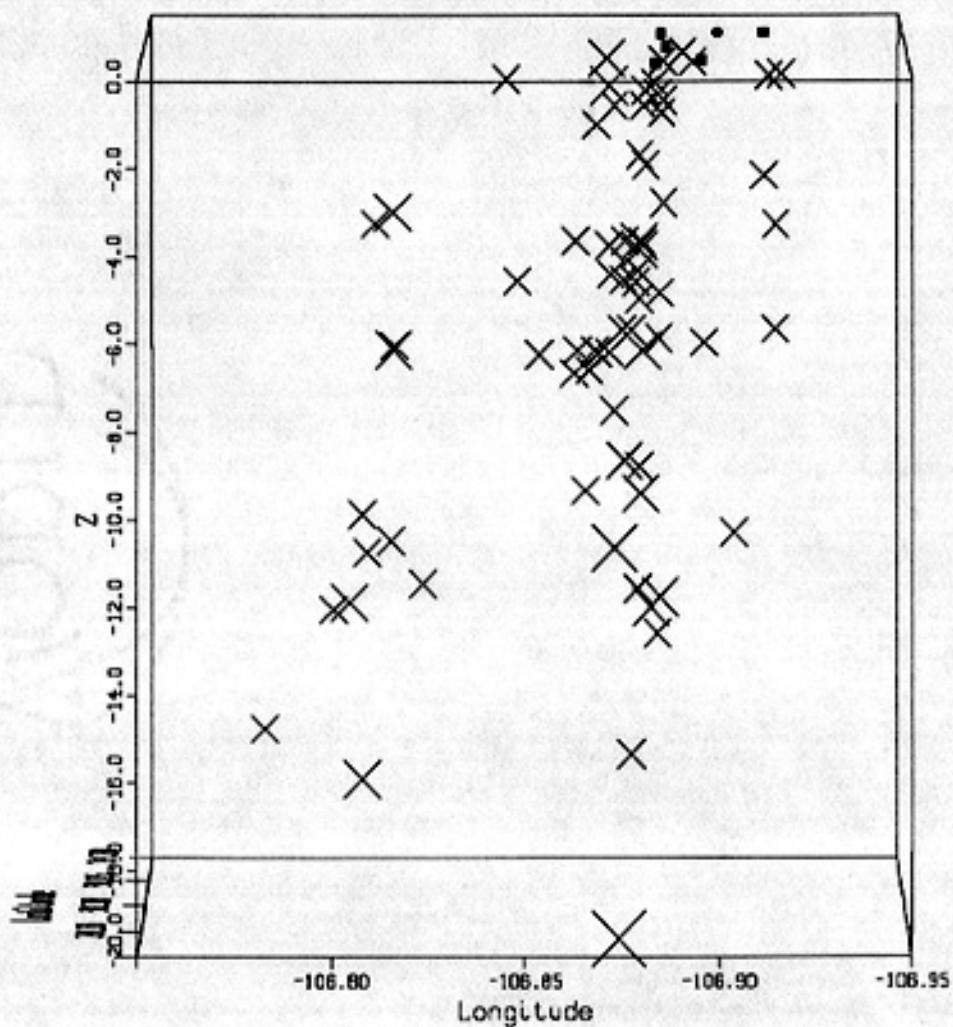
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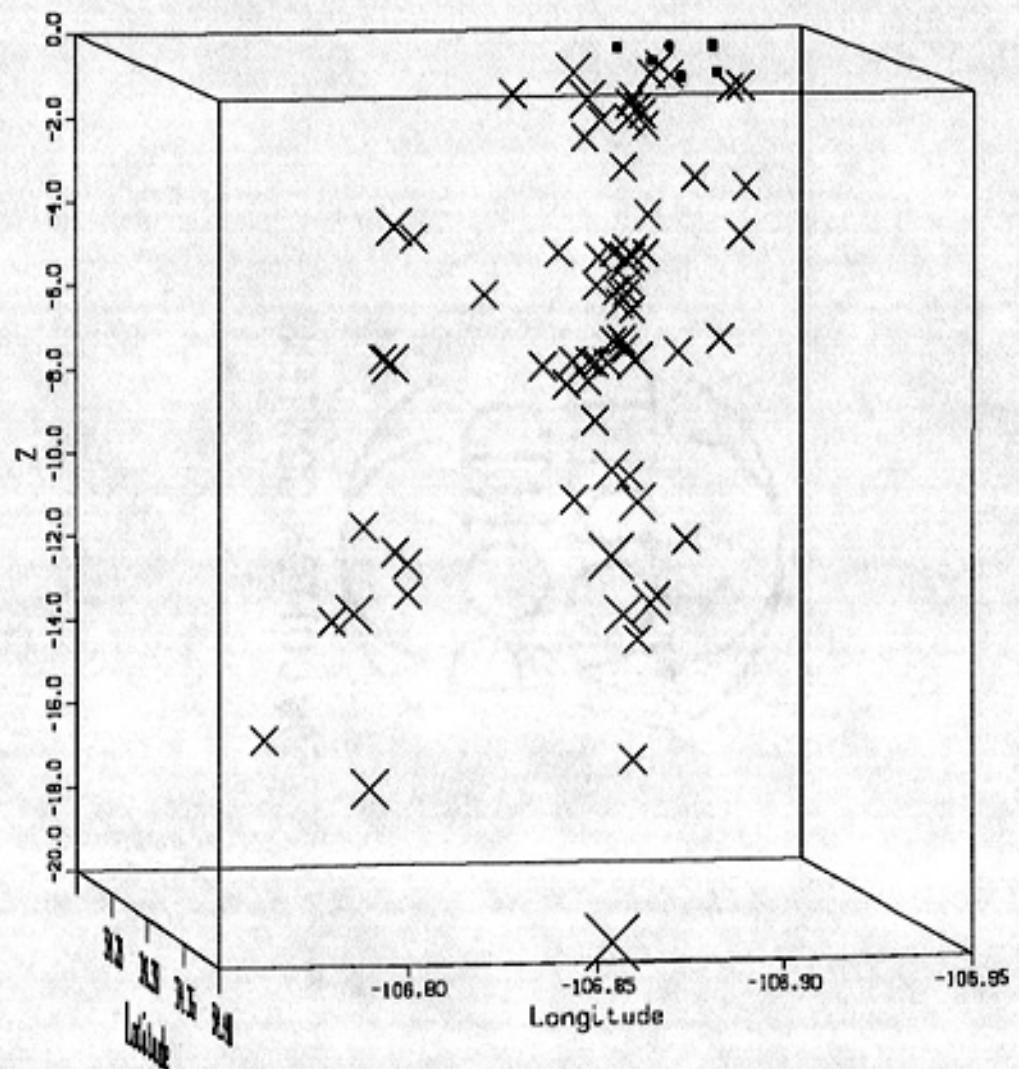
Events of Md > 1.0 at 60
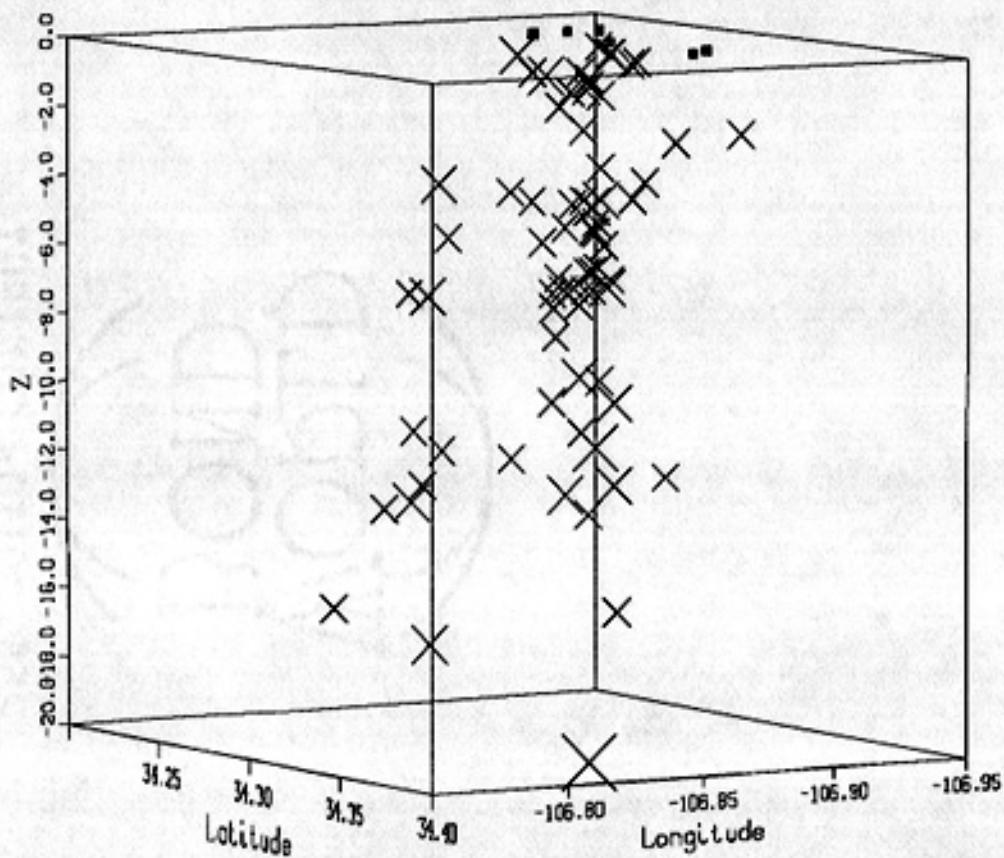
Events of Md > 1.0 at 50
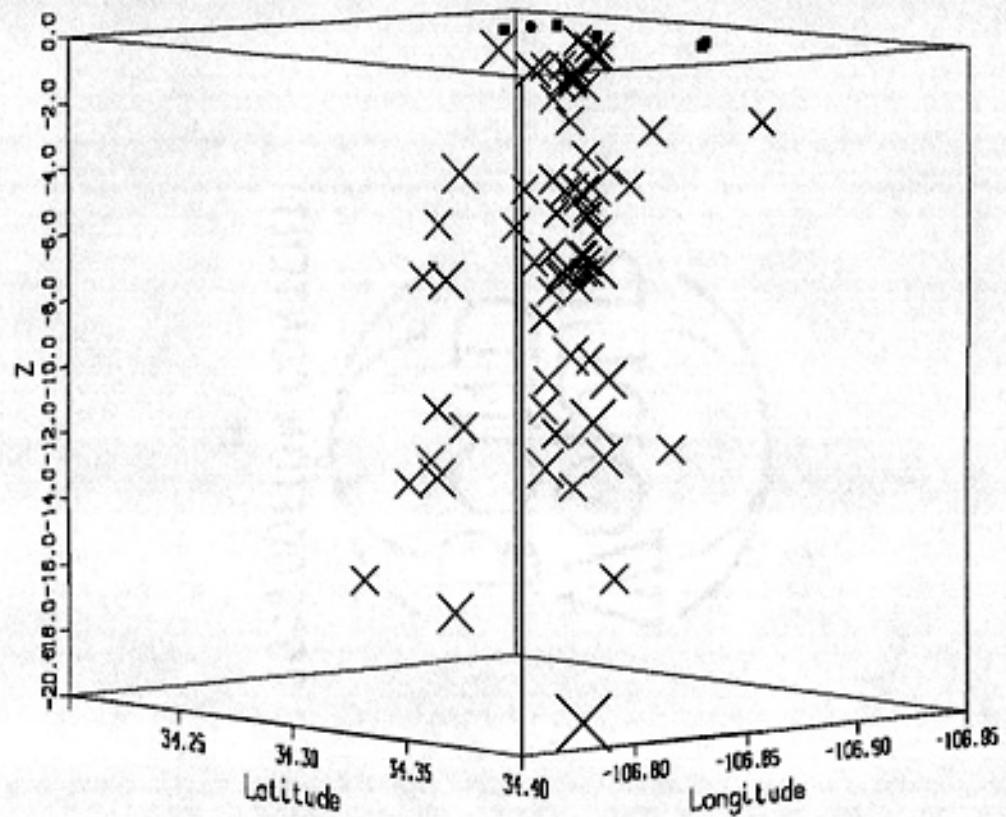
Events of Md > 1.0 at 30
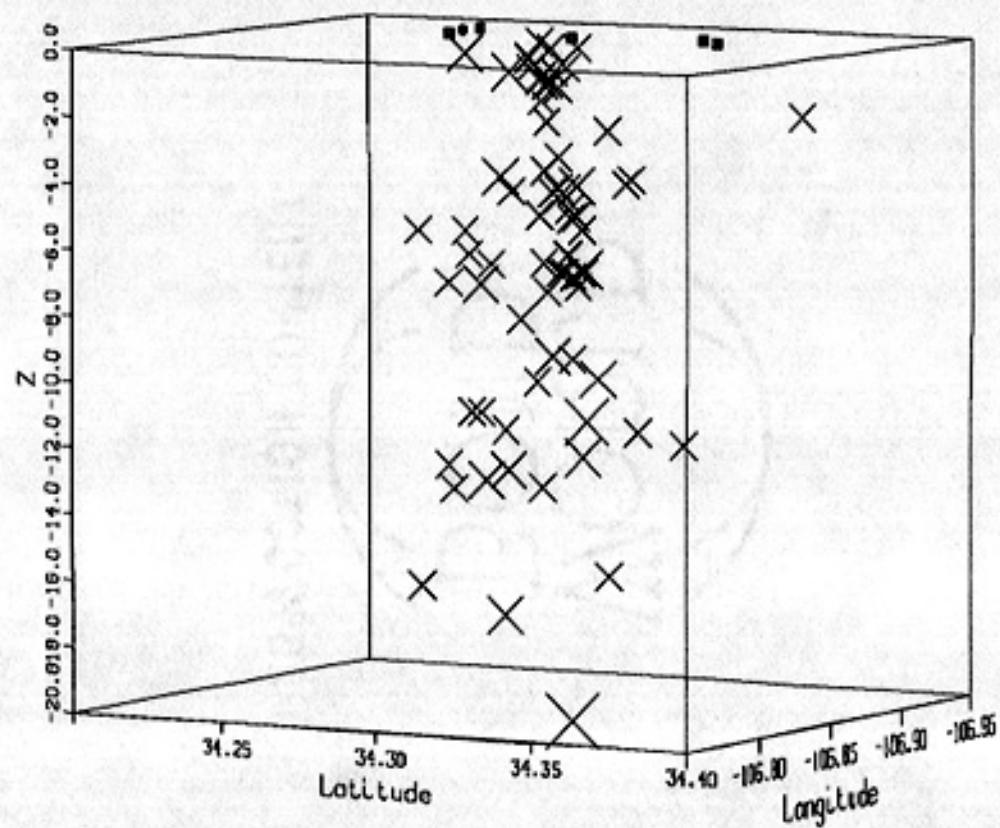
Events of Md > 1.0 at D
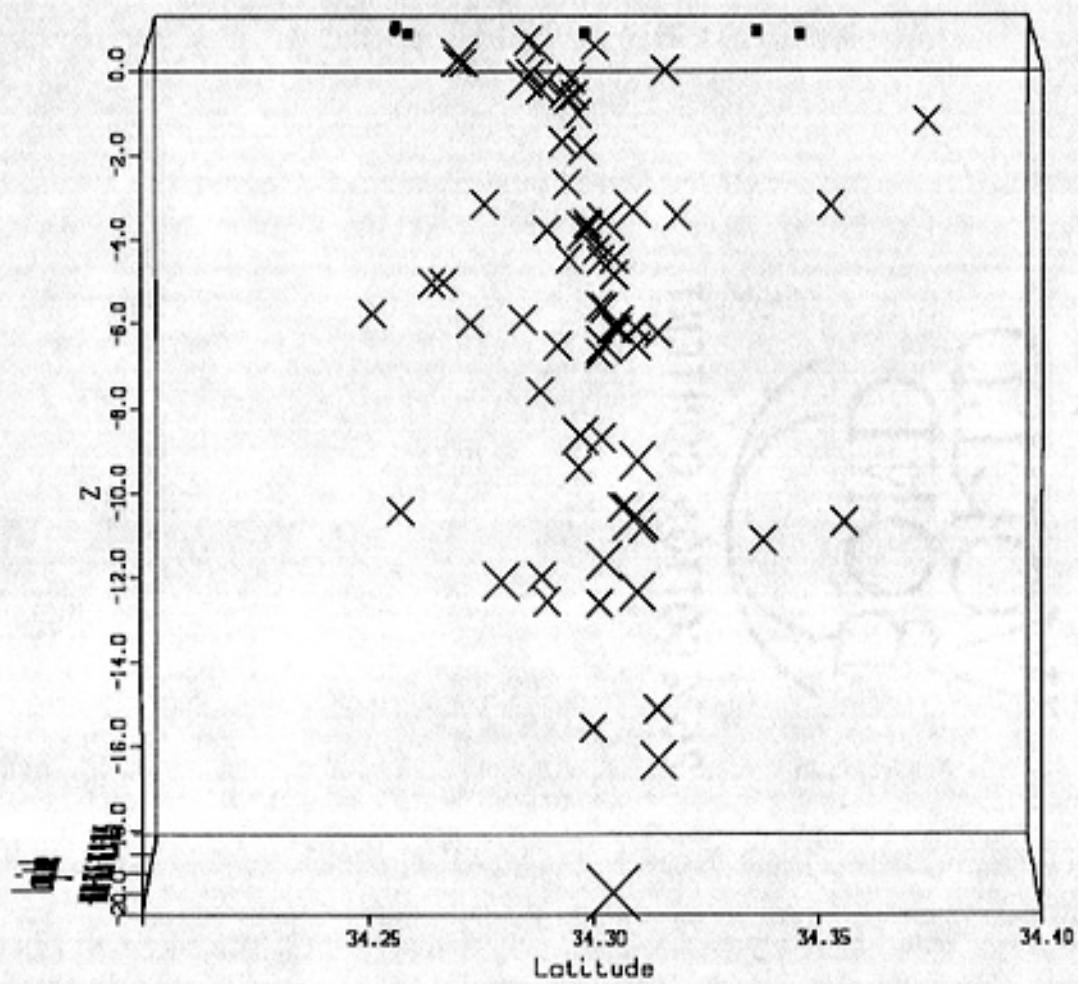
Events of Md > 1.0 at -10
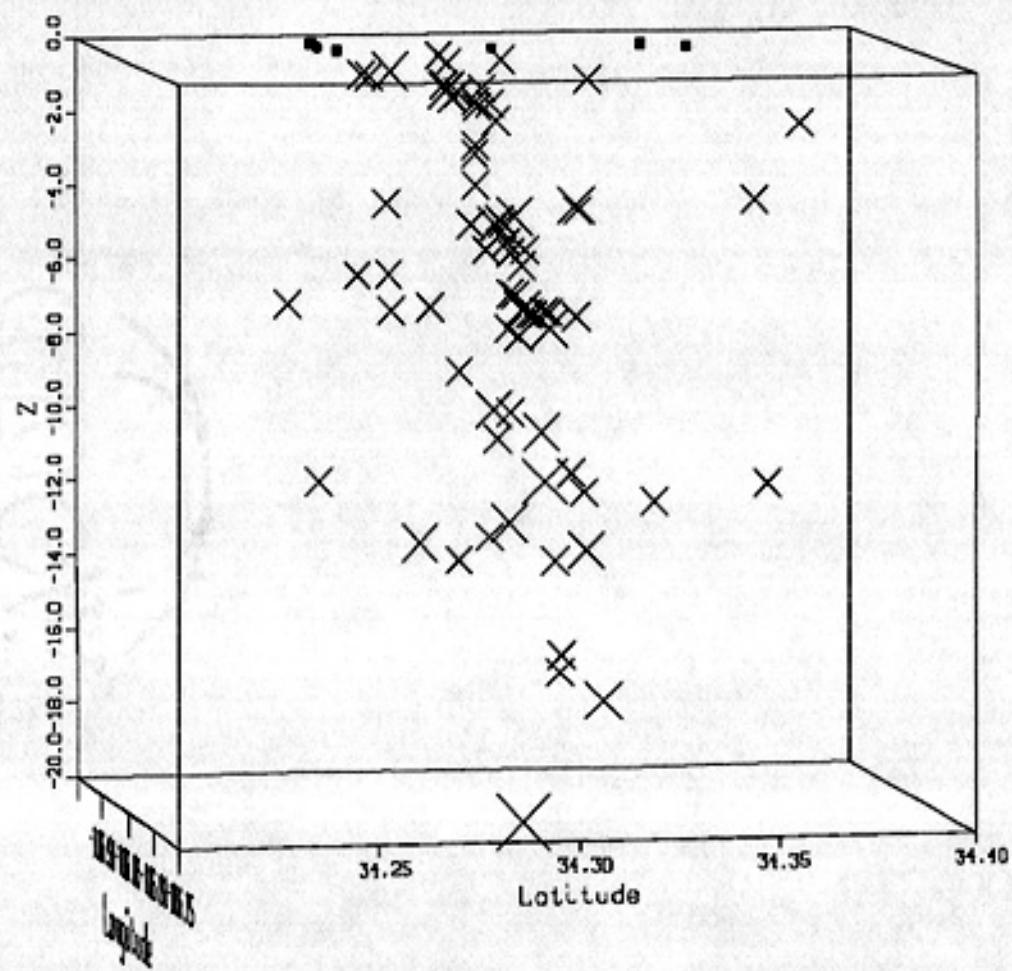
Events of Md > 1.0 at -20
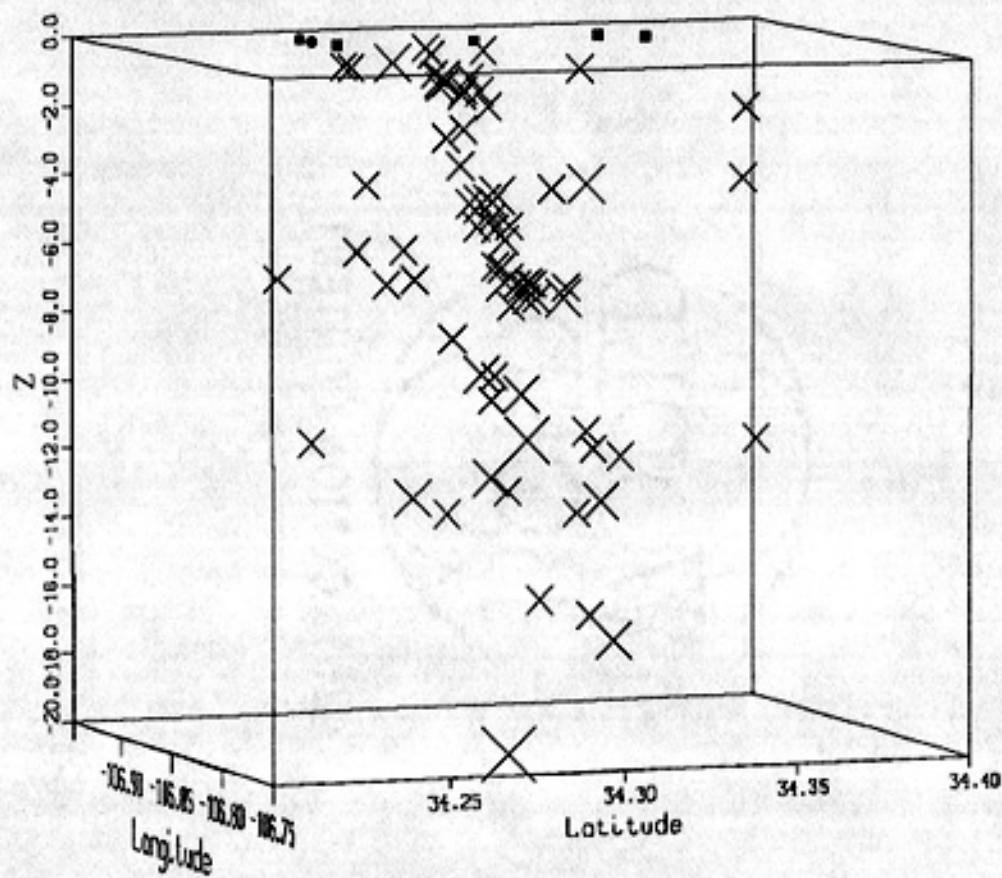
Events of Md > 1.0 at -60
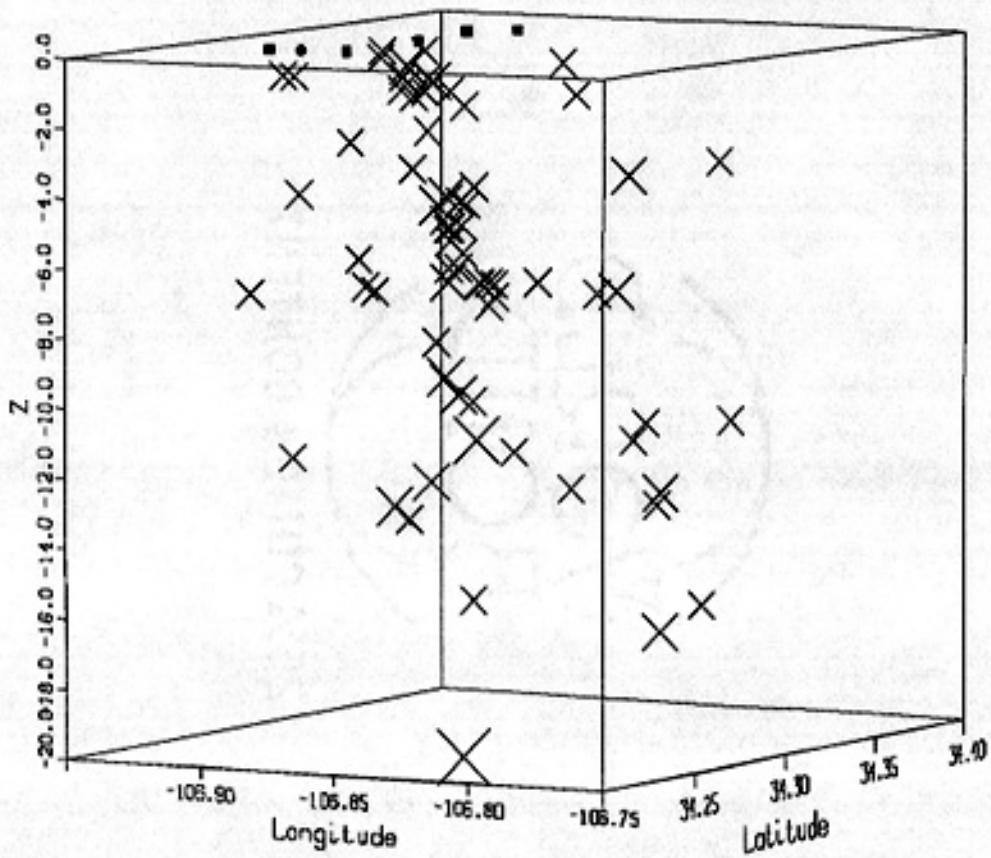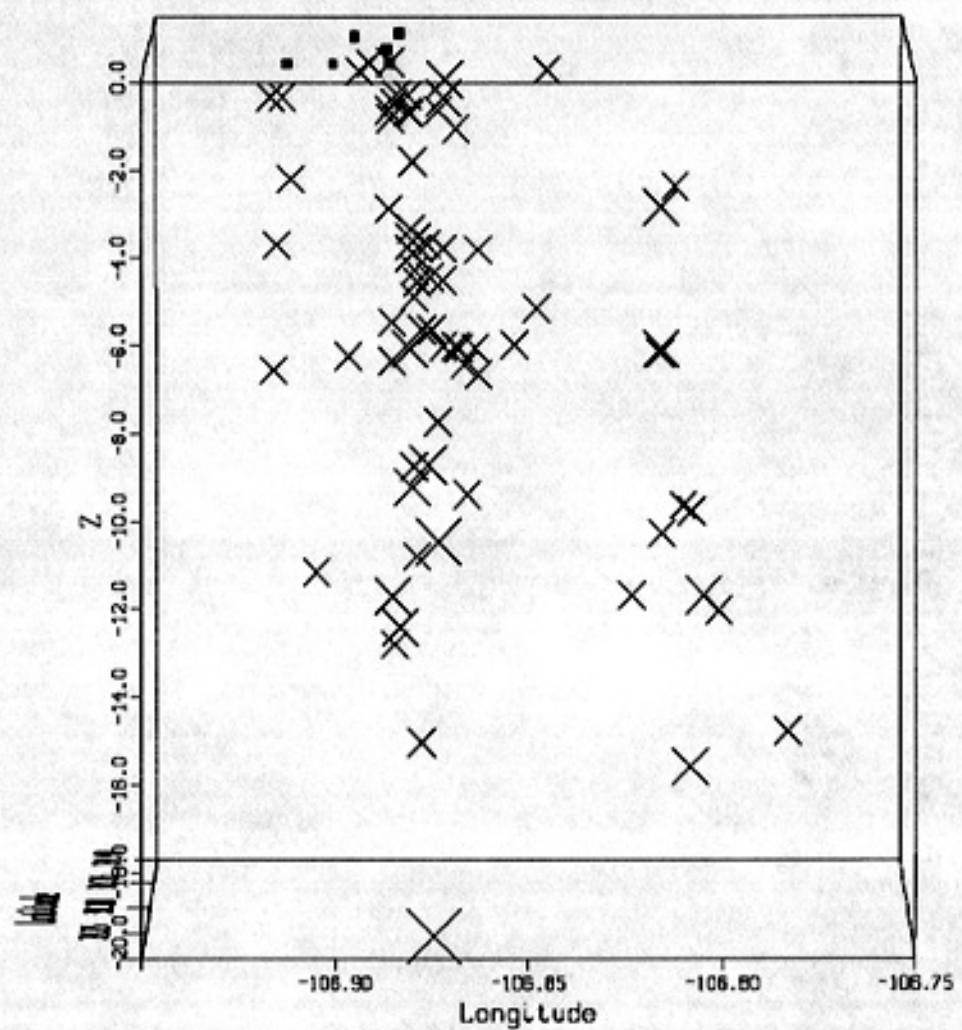
Events of Md > 1.0 at -90

3-D plots of the AAA and BAB quality hypocenters
(symbols are decreasing with depth)

eee347beb7078025

Longitude
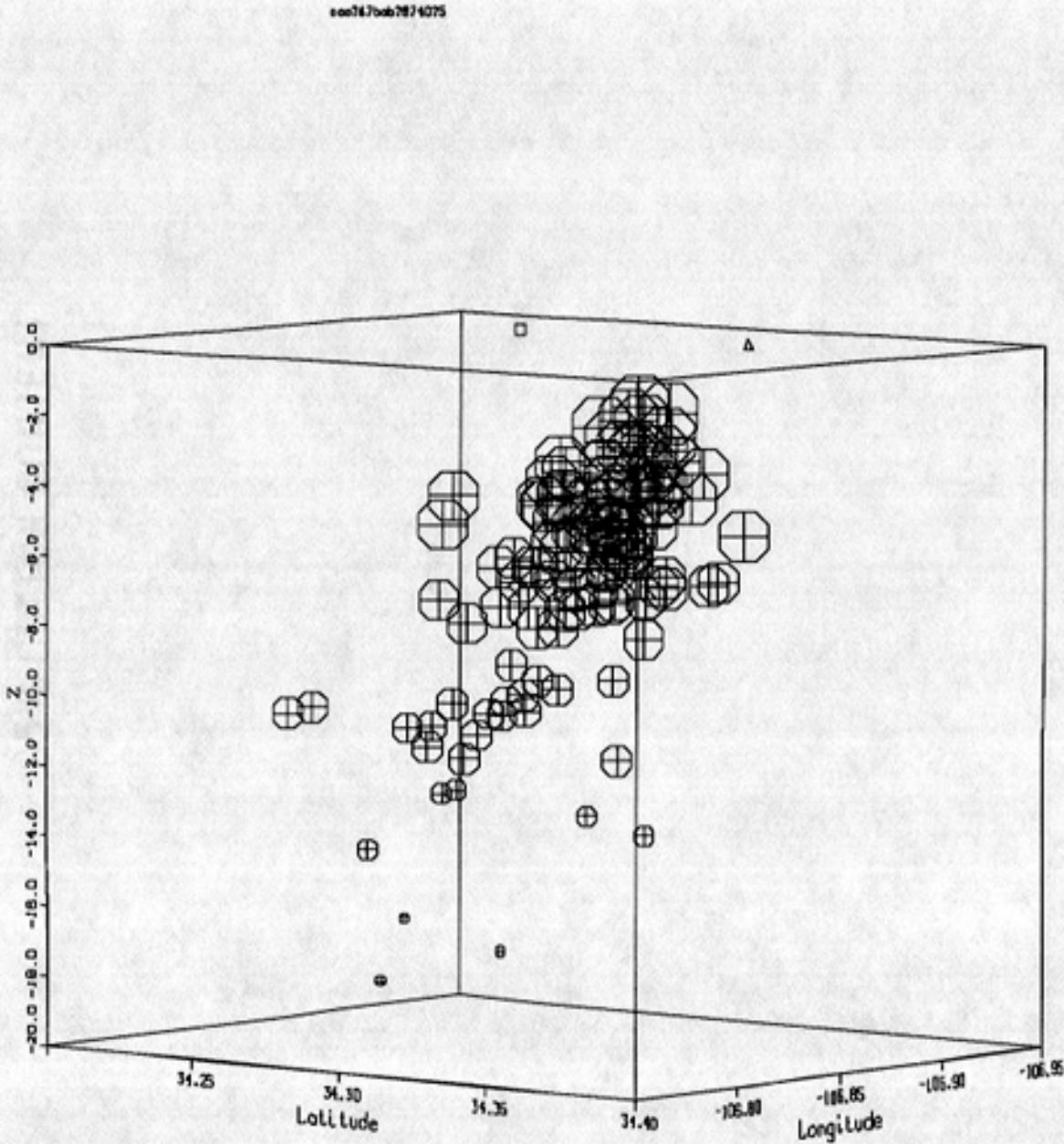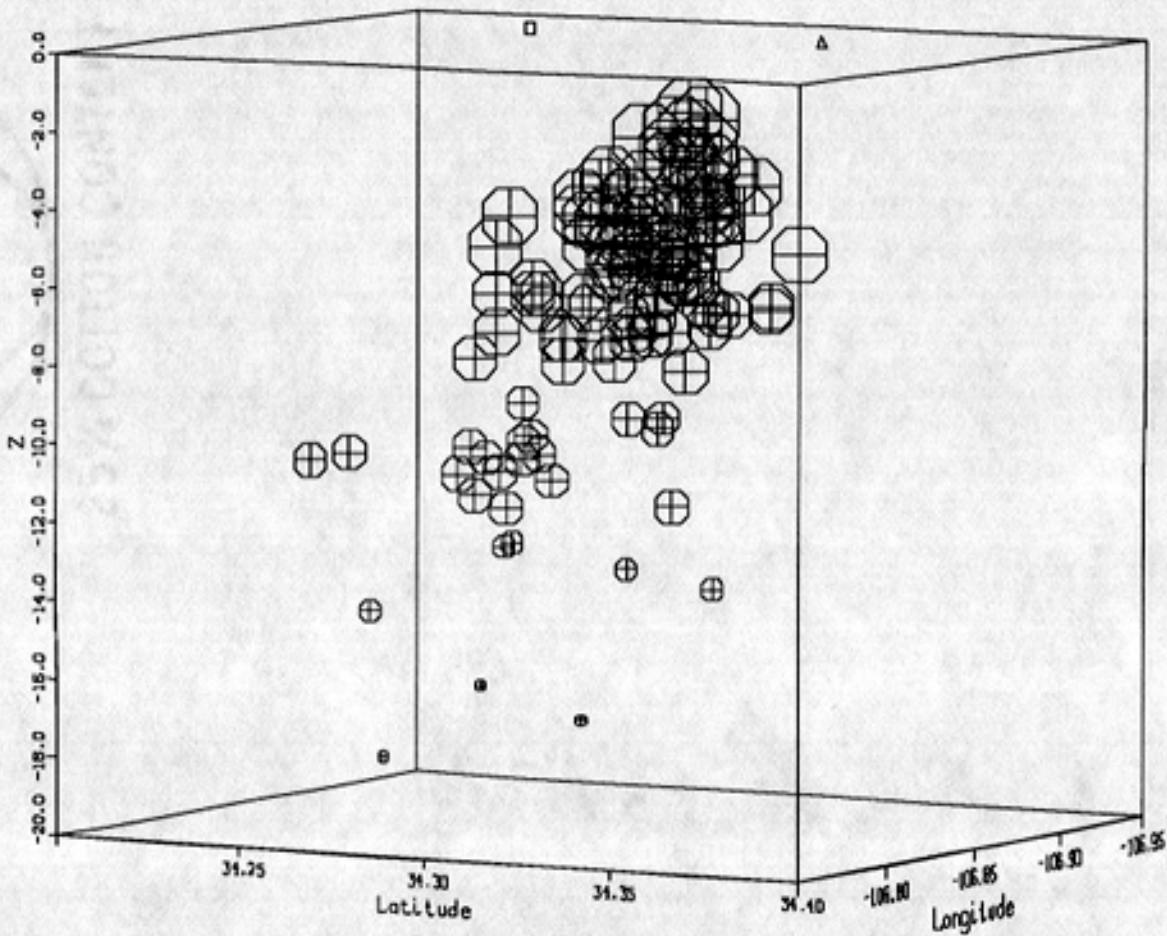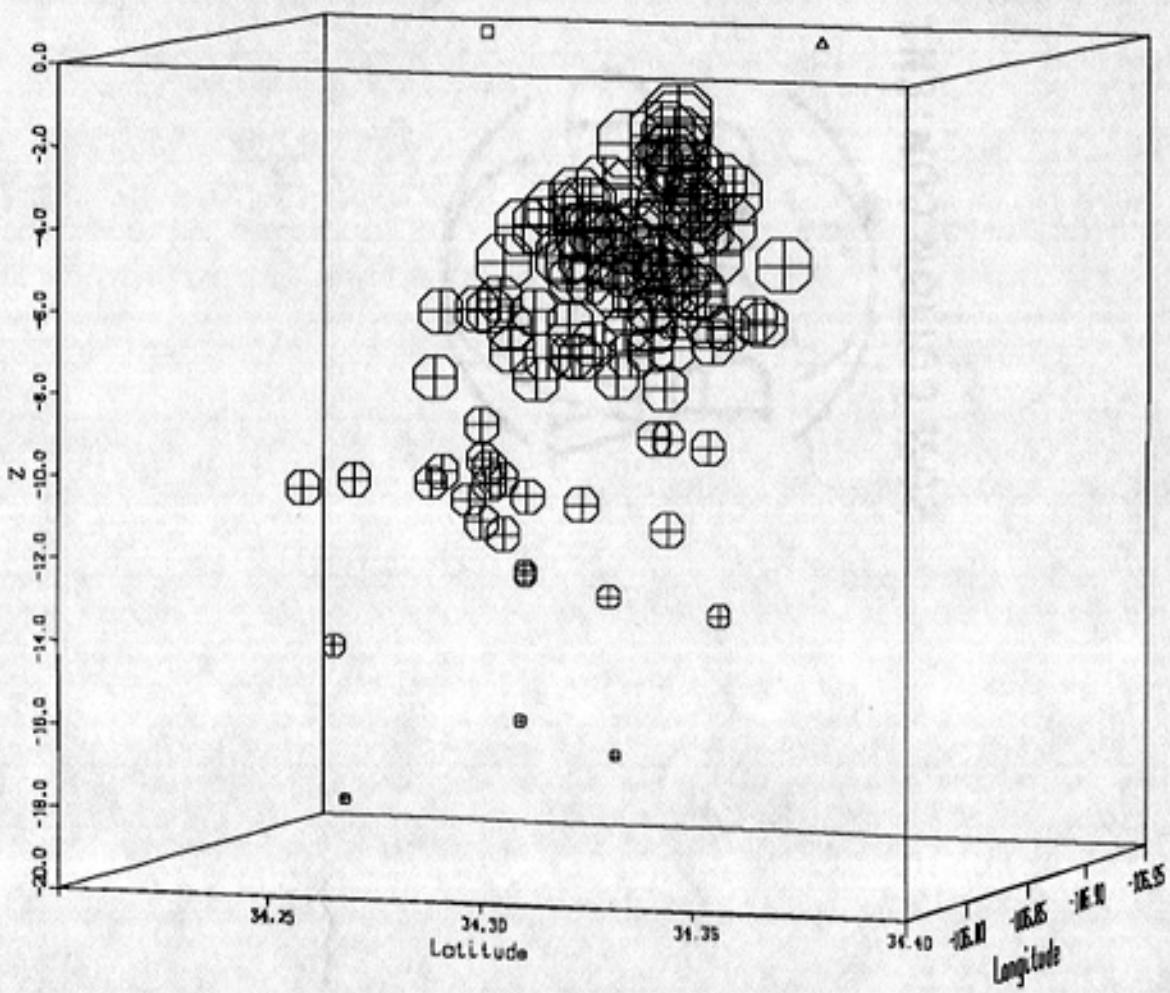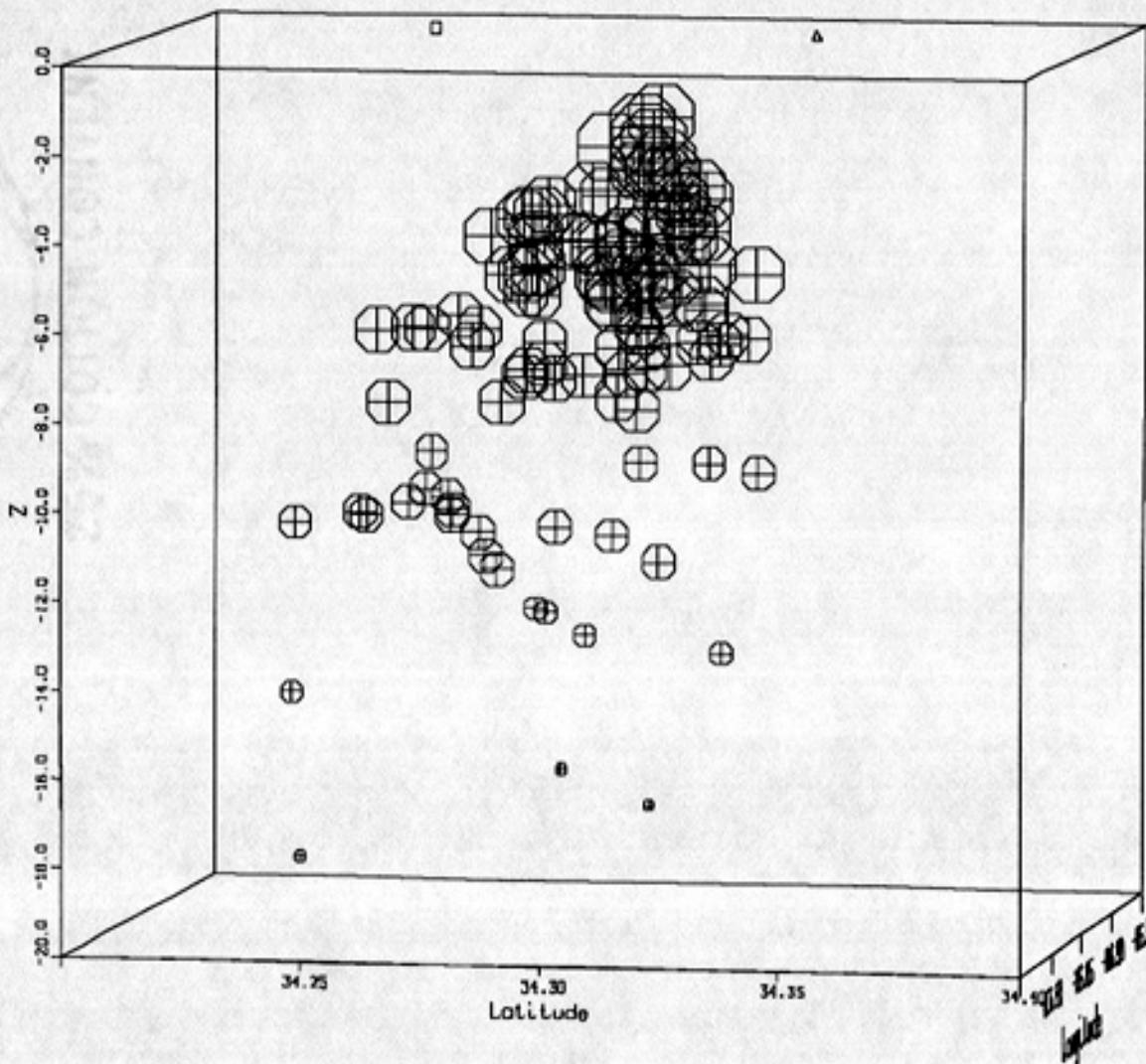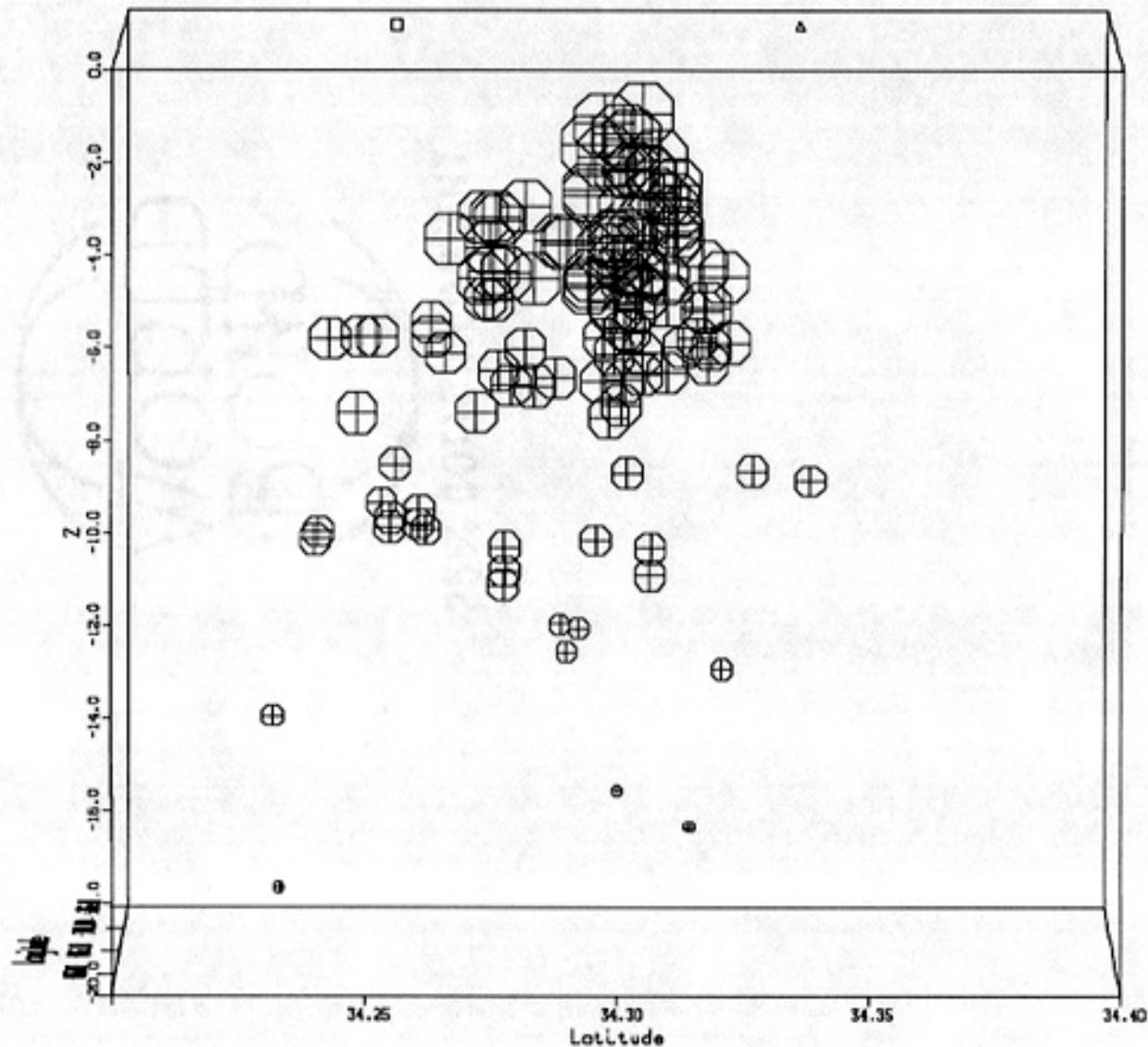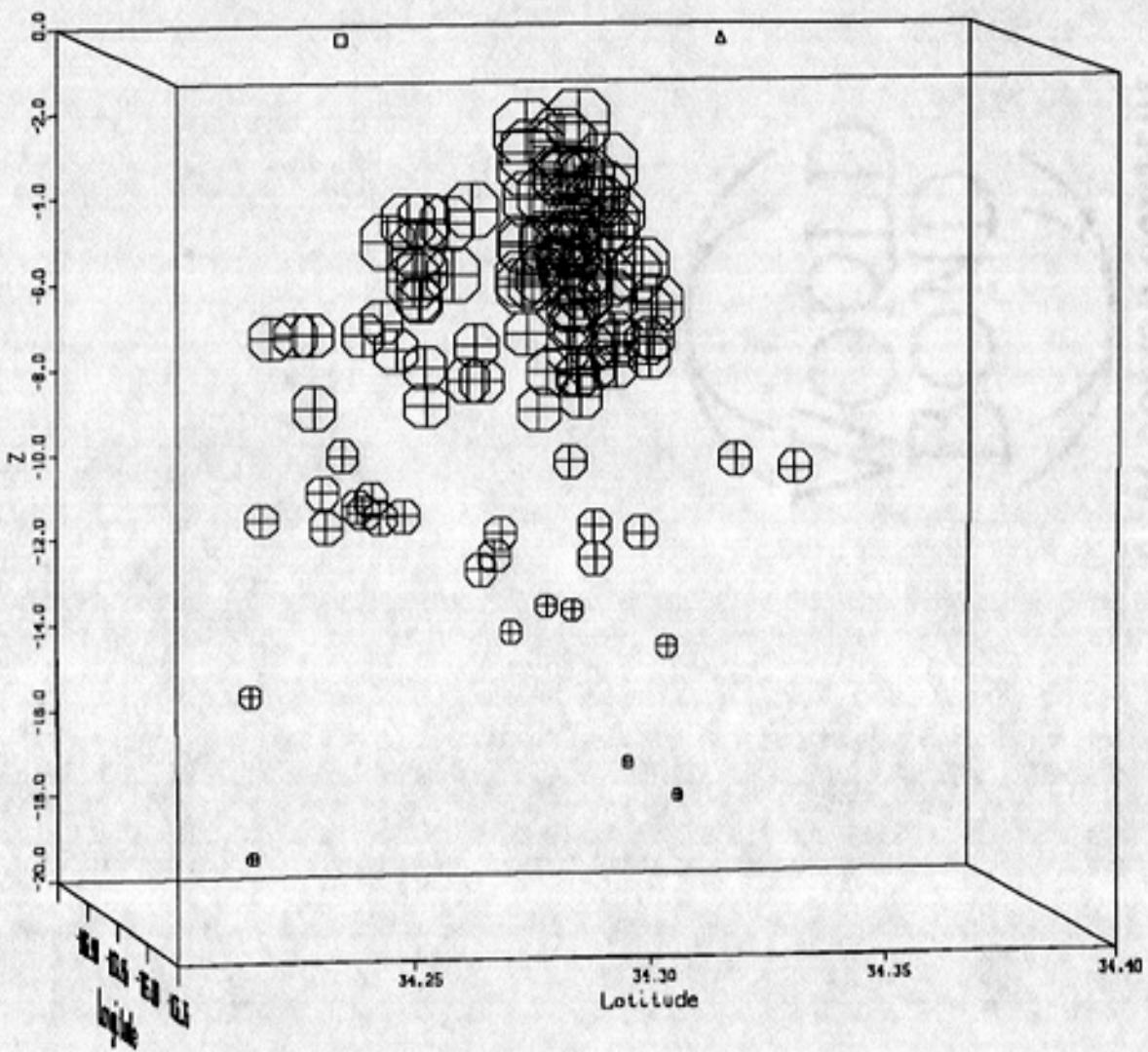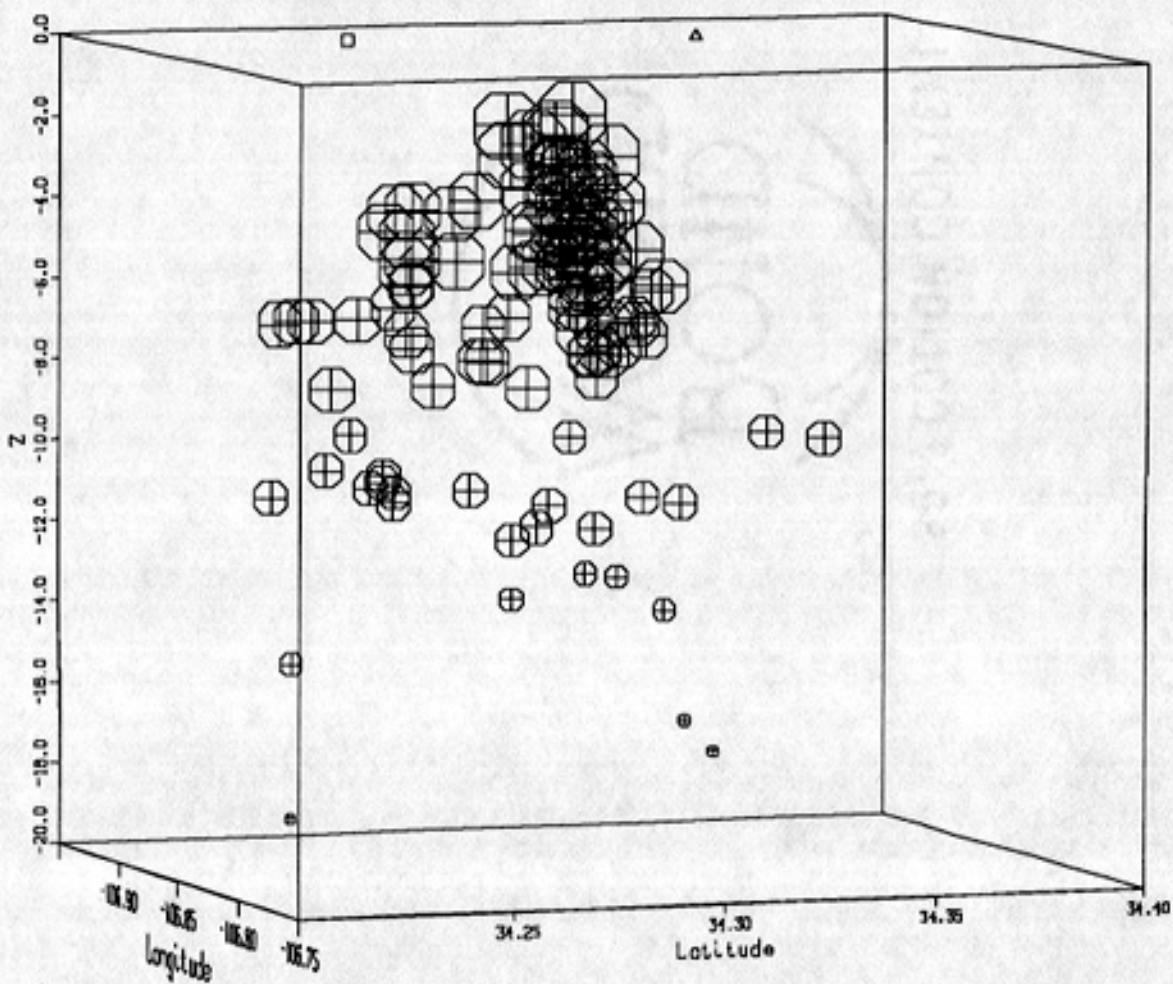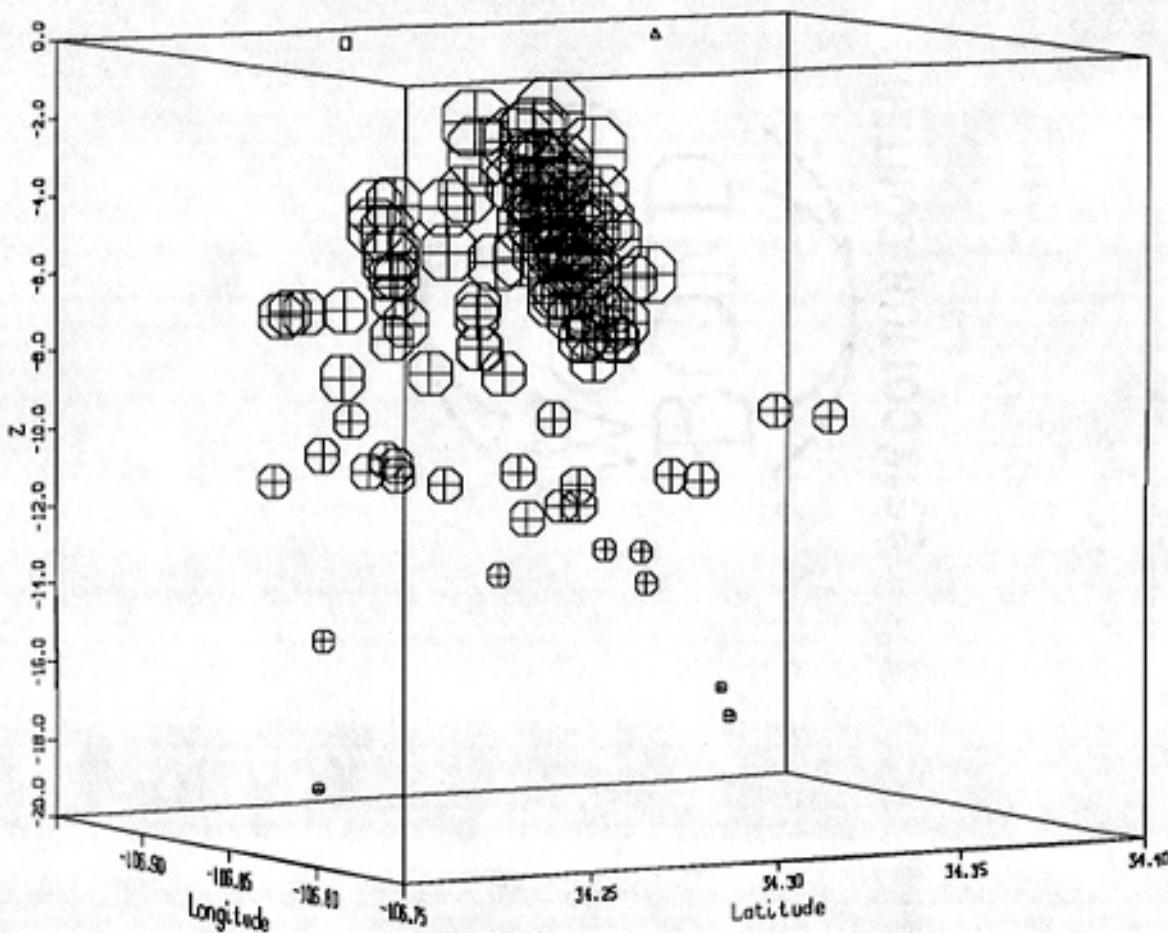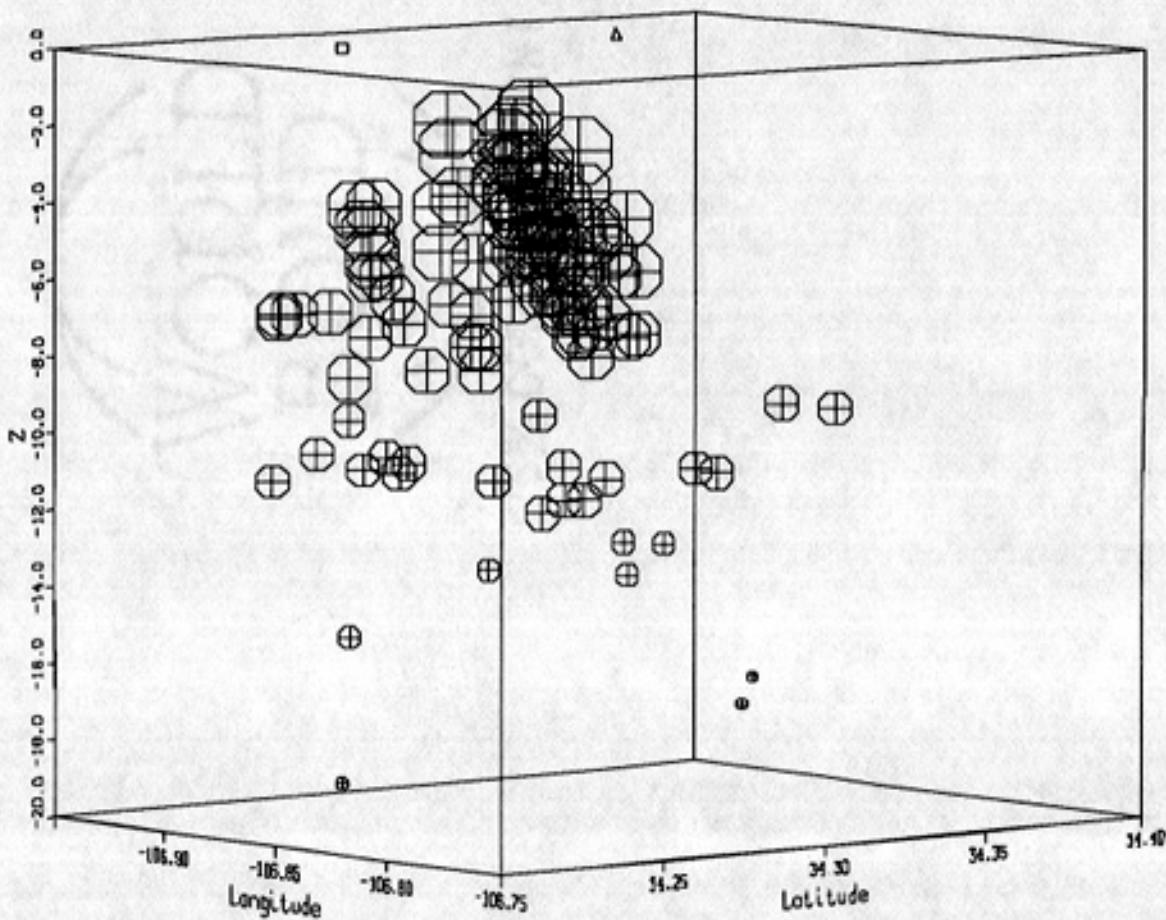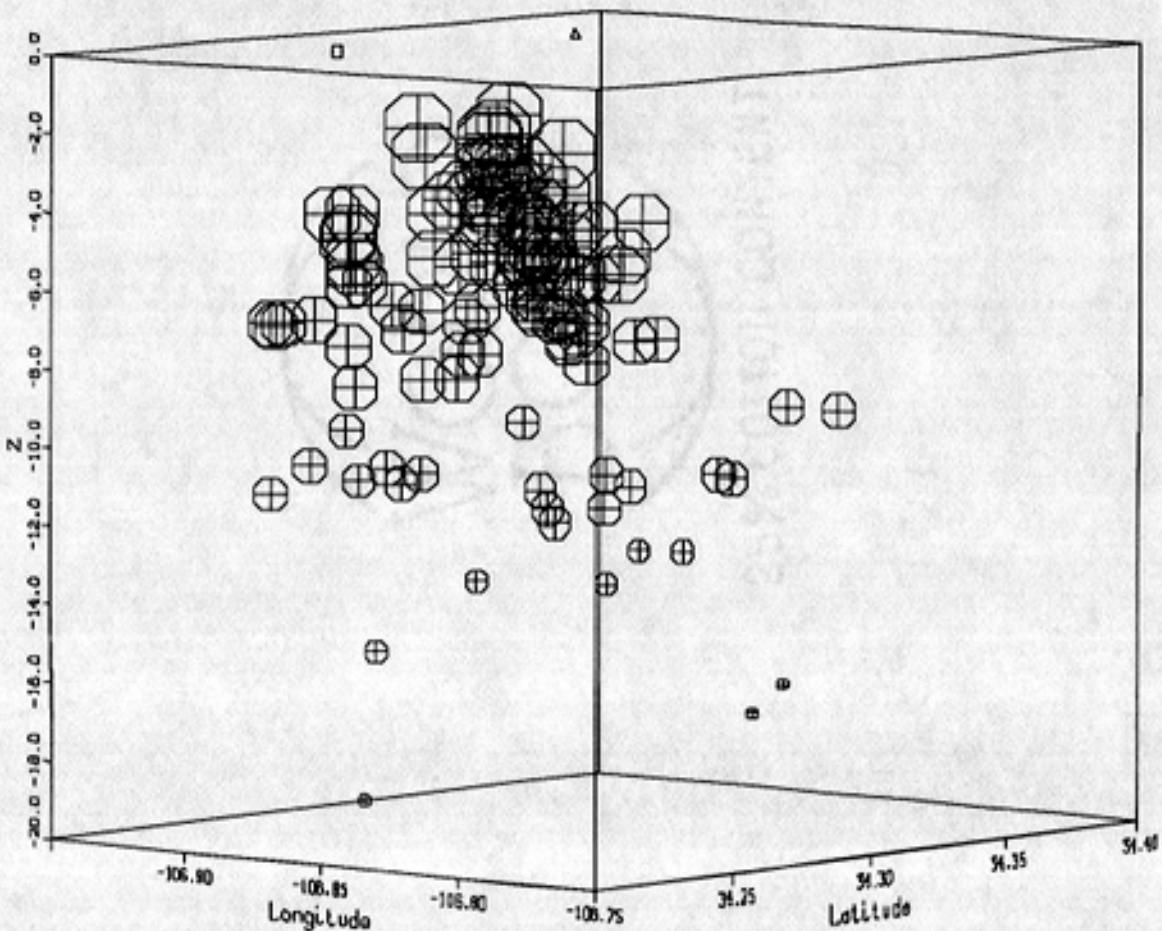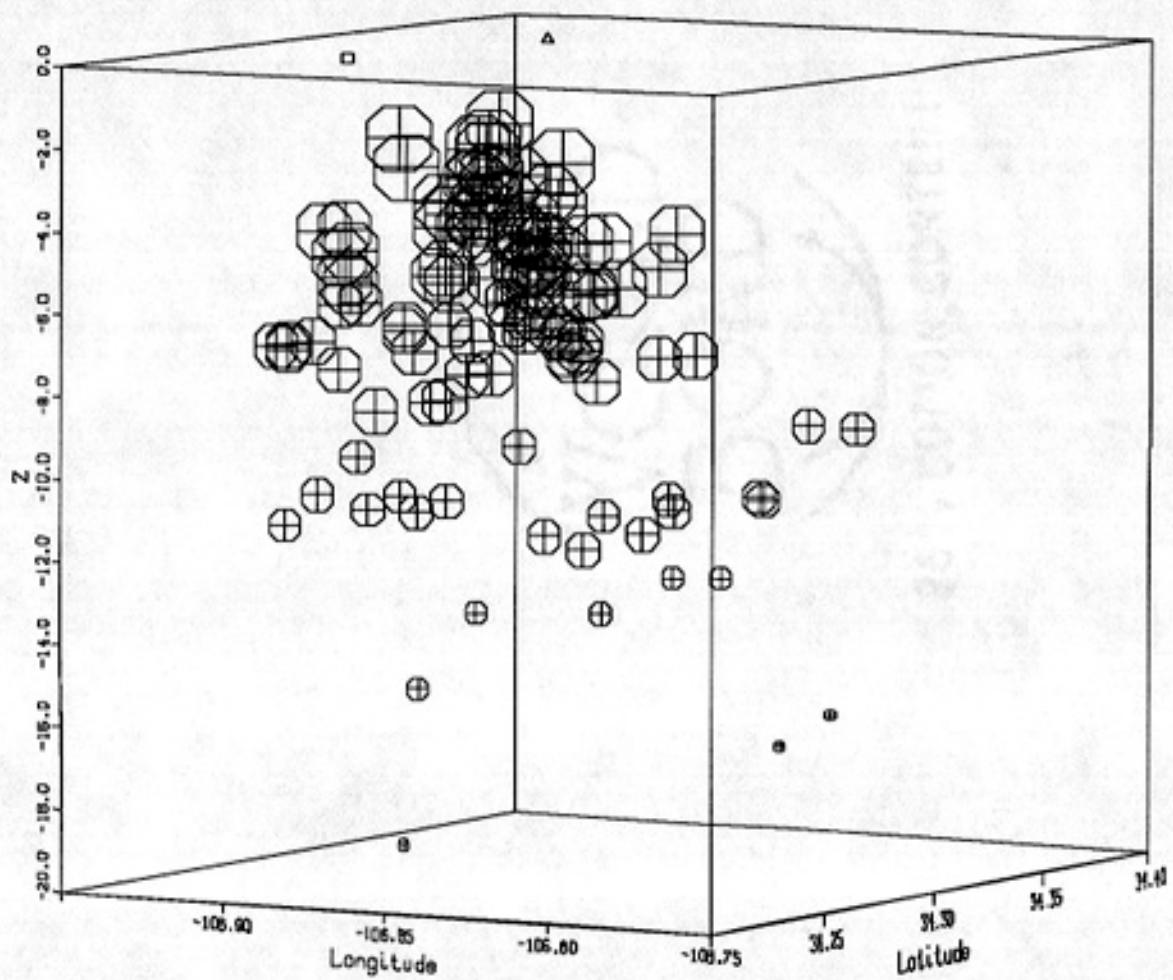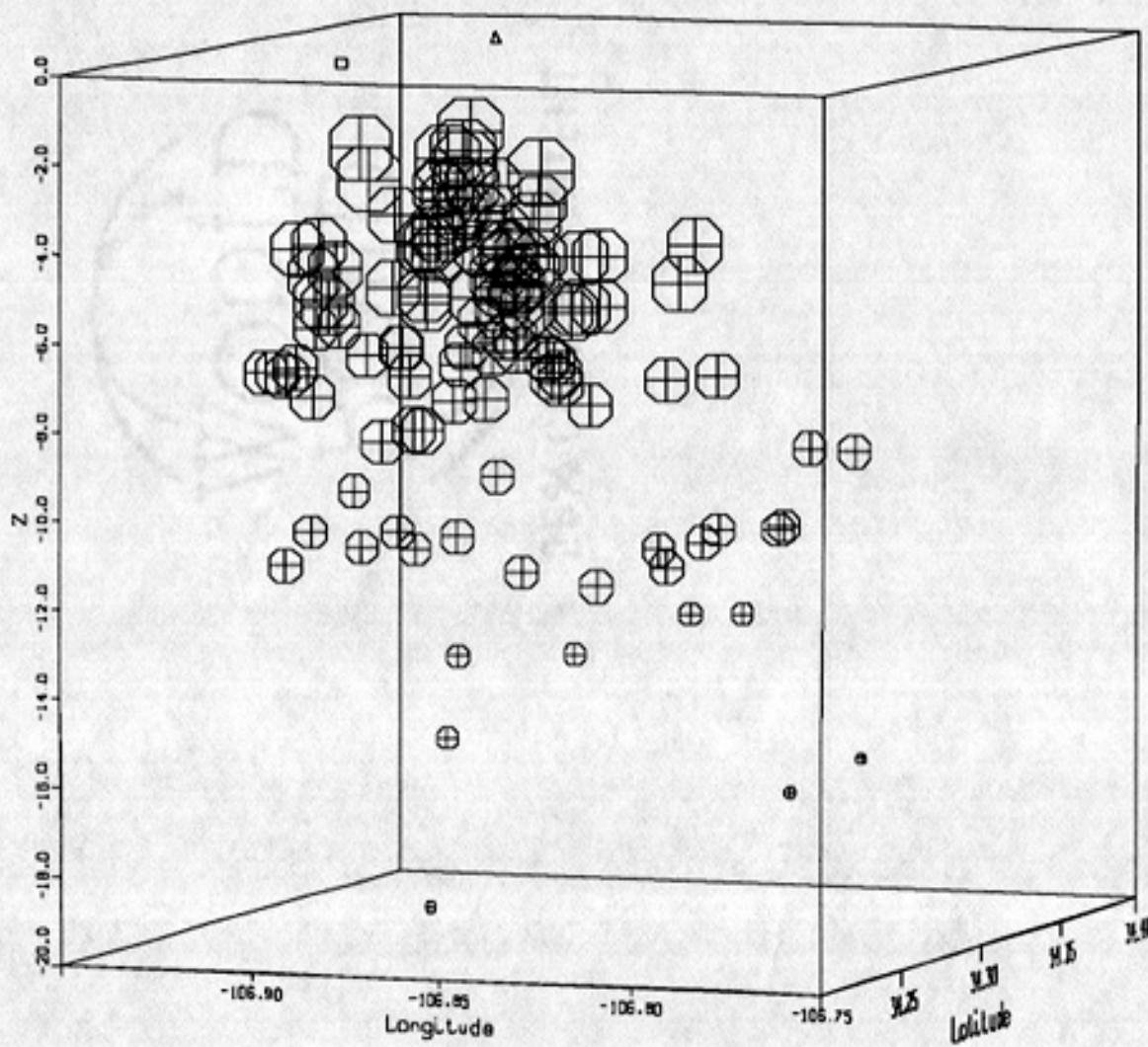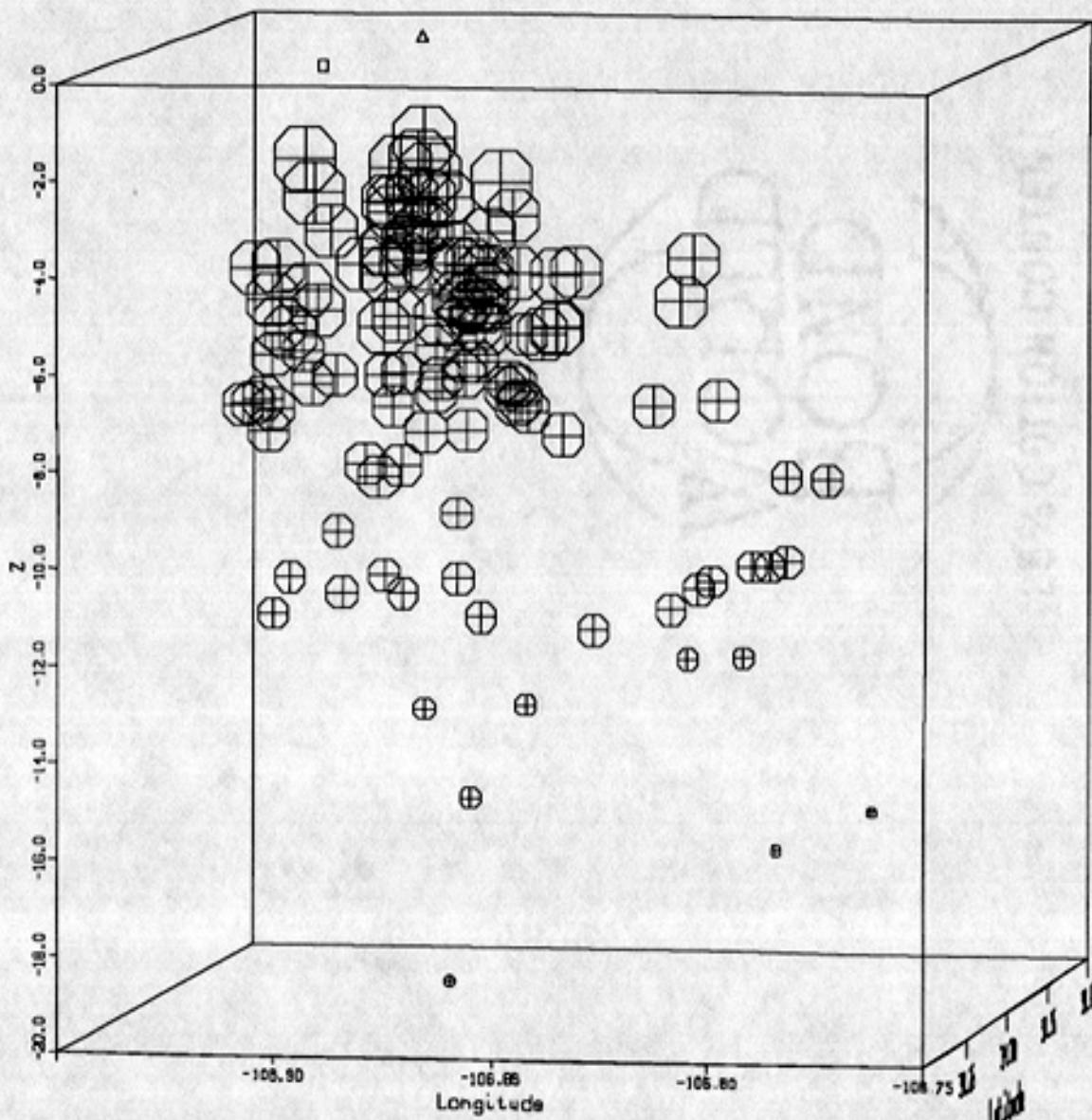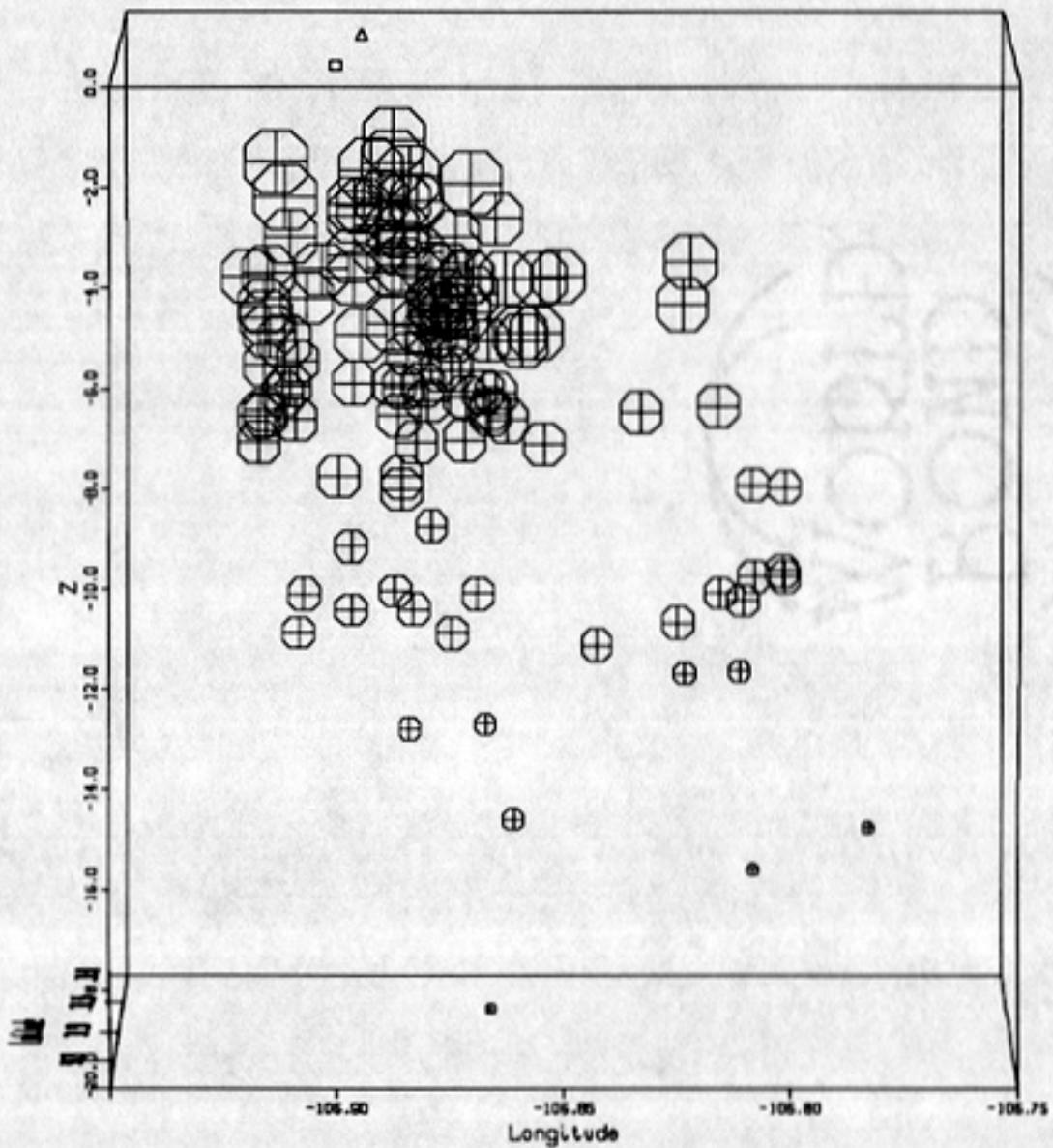
3-D plots of the anomalous fault plane solution

(symbols are decreasing with depth)

anomalous events

Latitude

Longitude

Z

anomalousevents

anomalous events
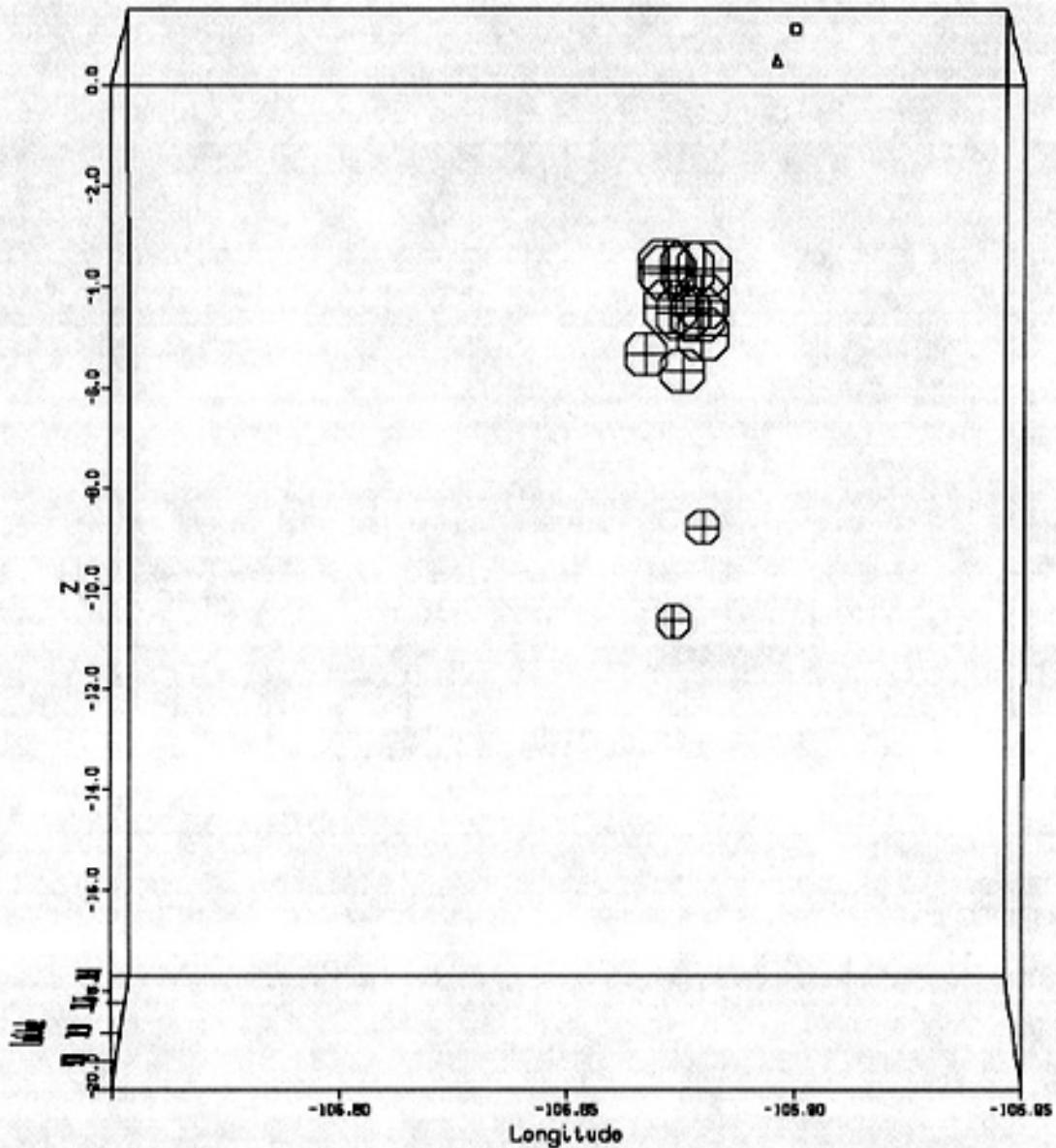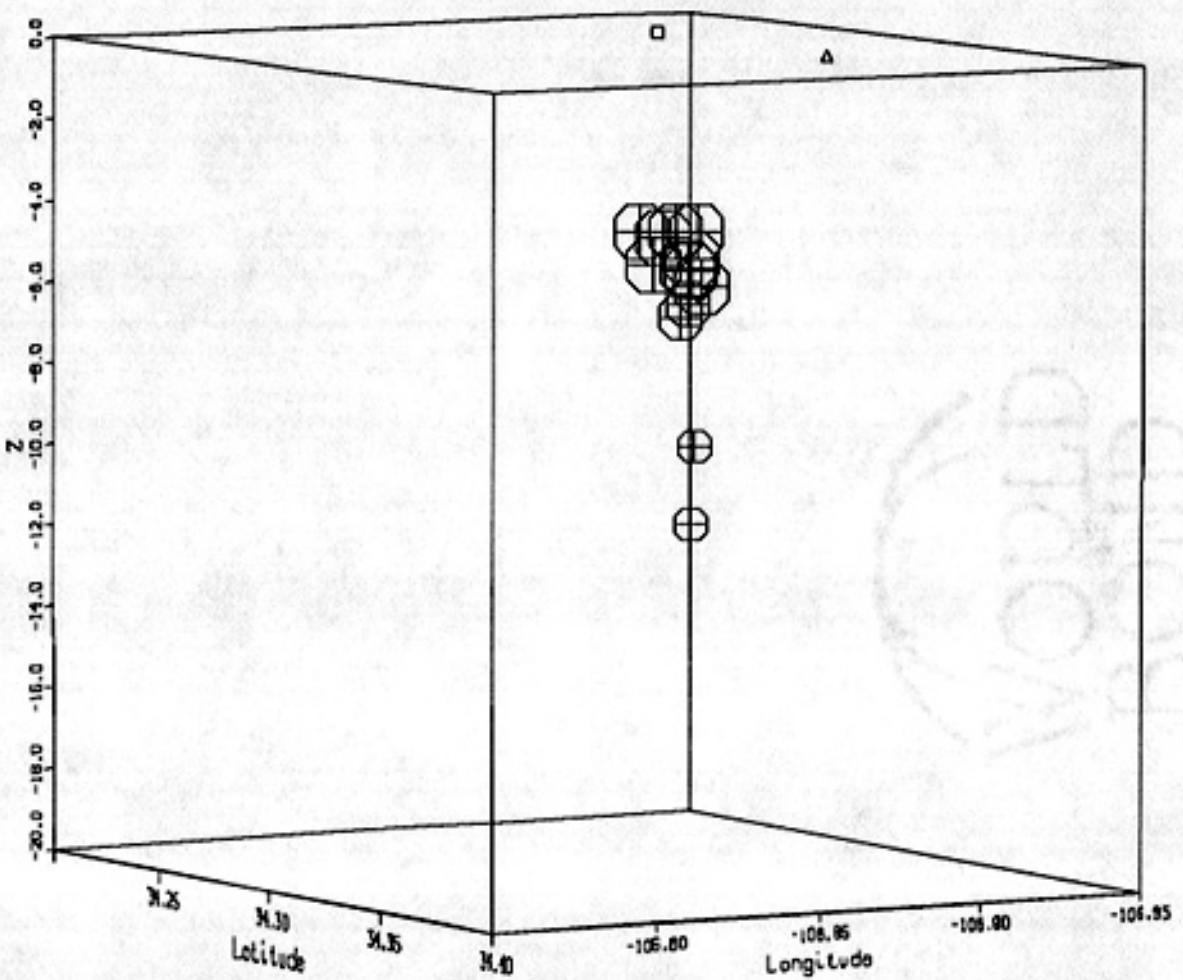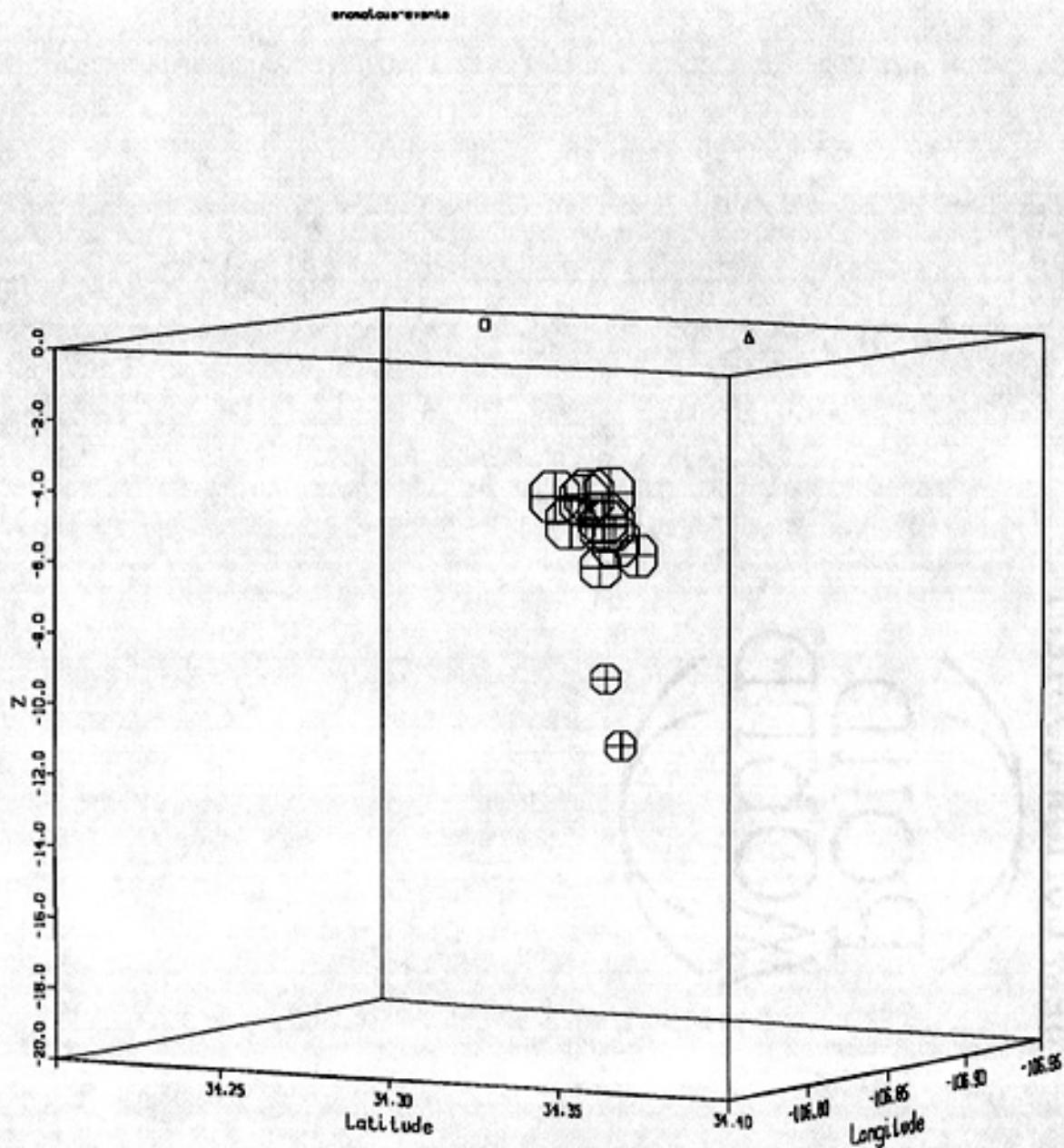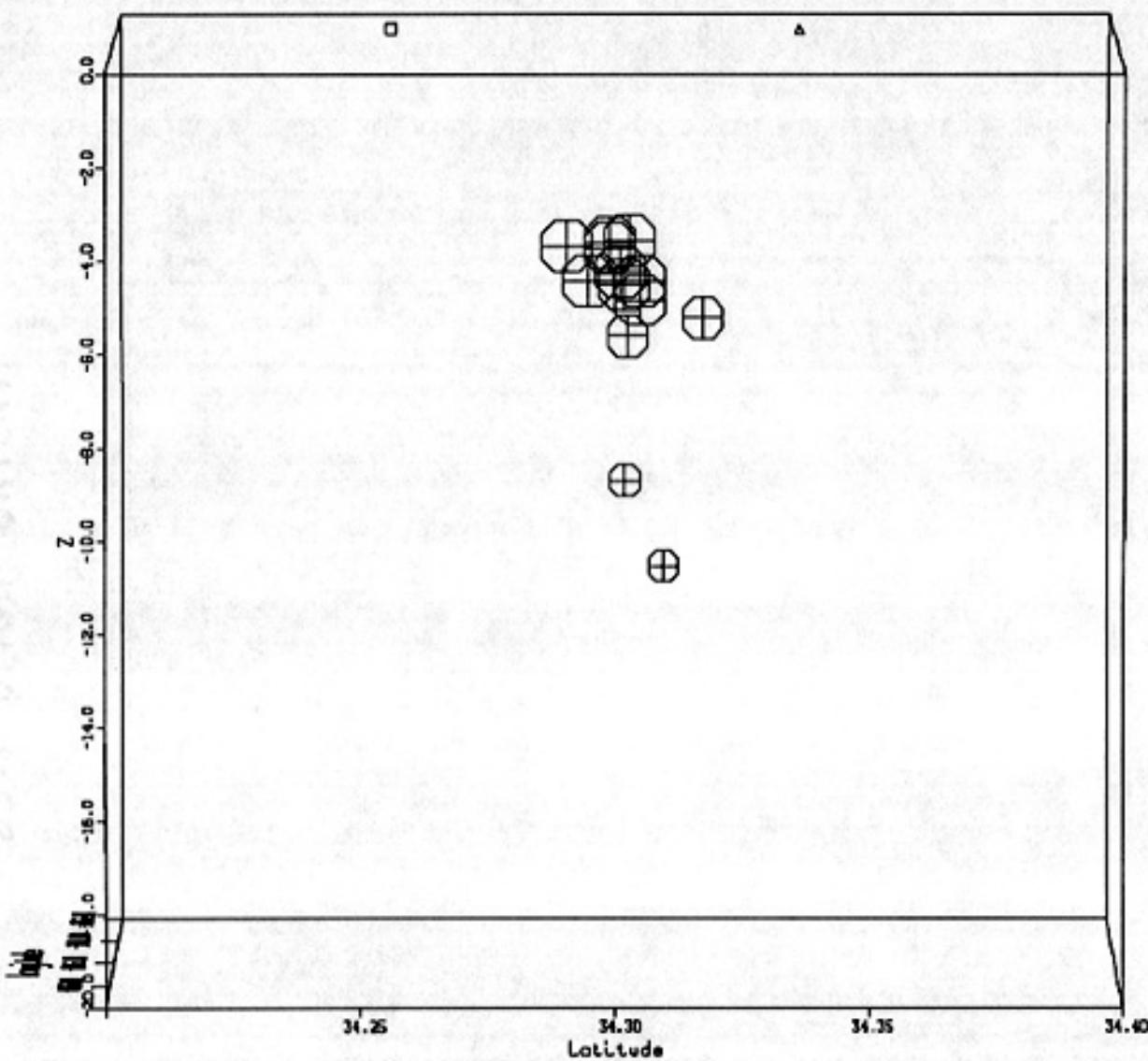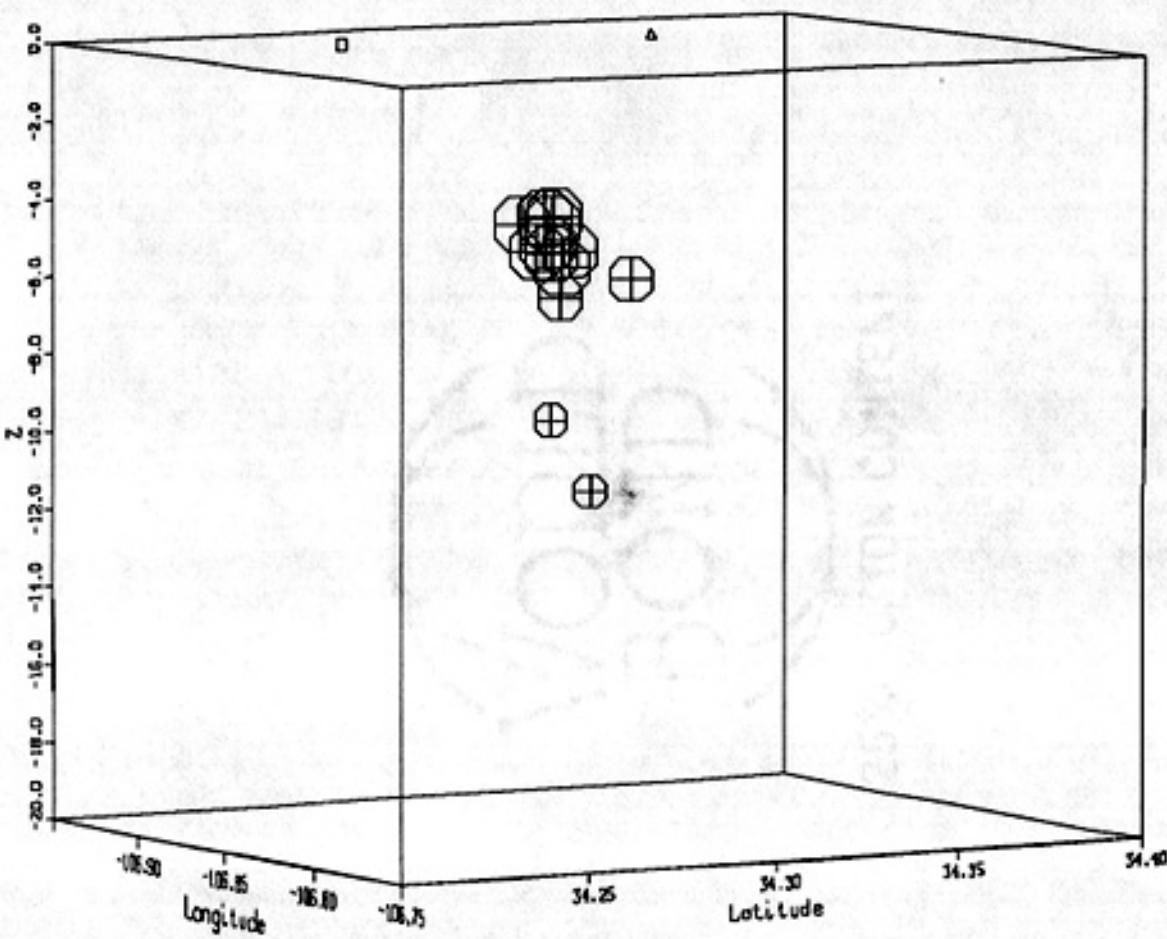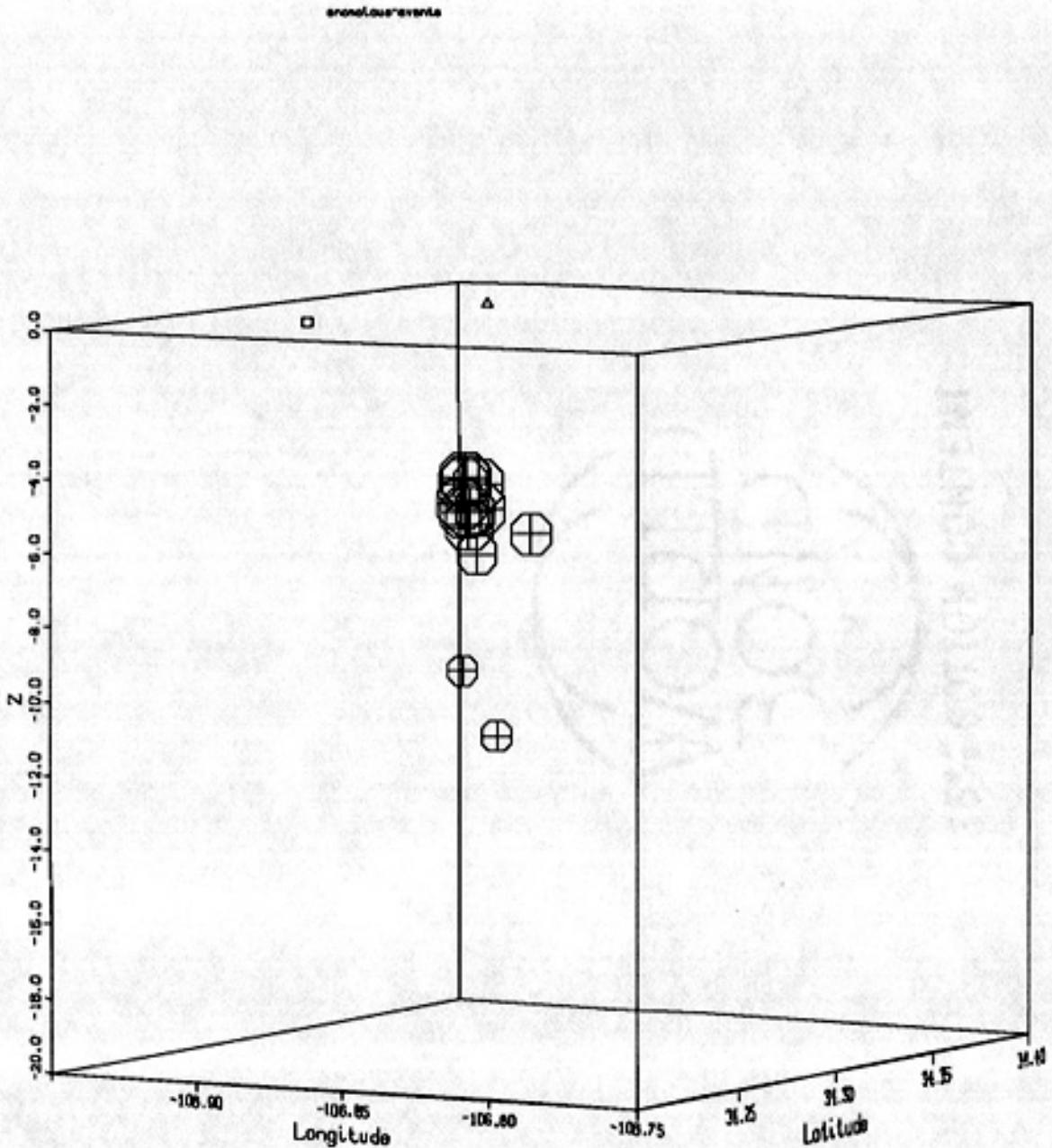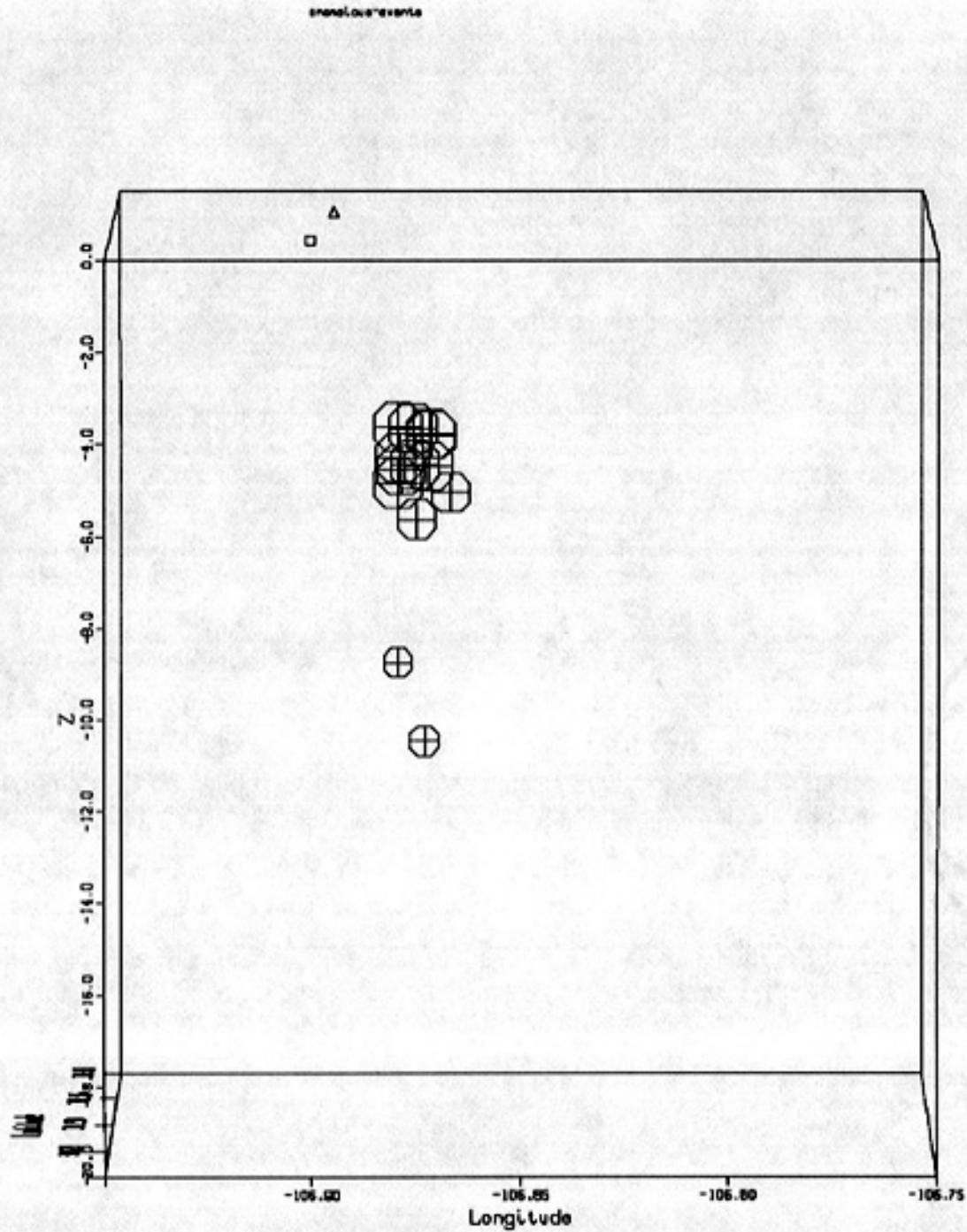
Appendix B

Plots of swarms to show migration patterns

Numbers are plotted at the epicenter in the order of the earthquakes occurrence.

1982 8/24 to 8/26 Swarm
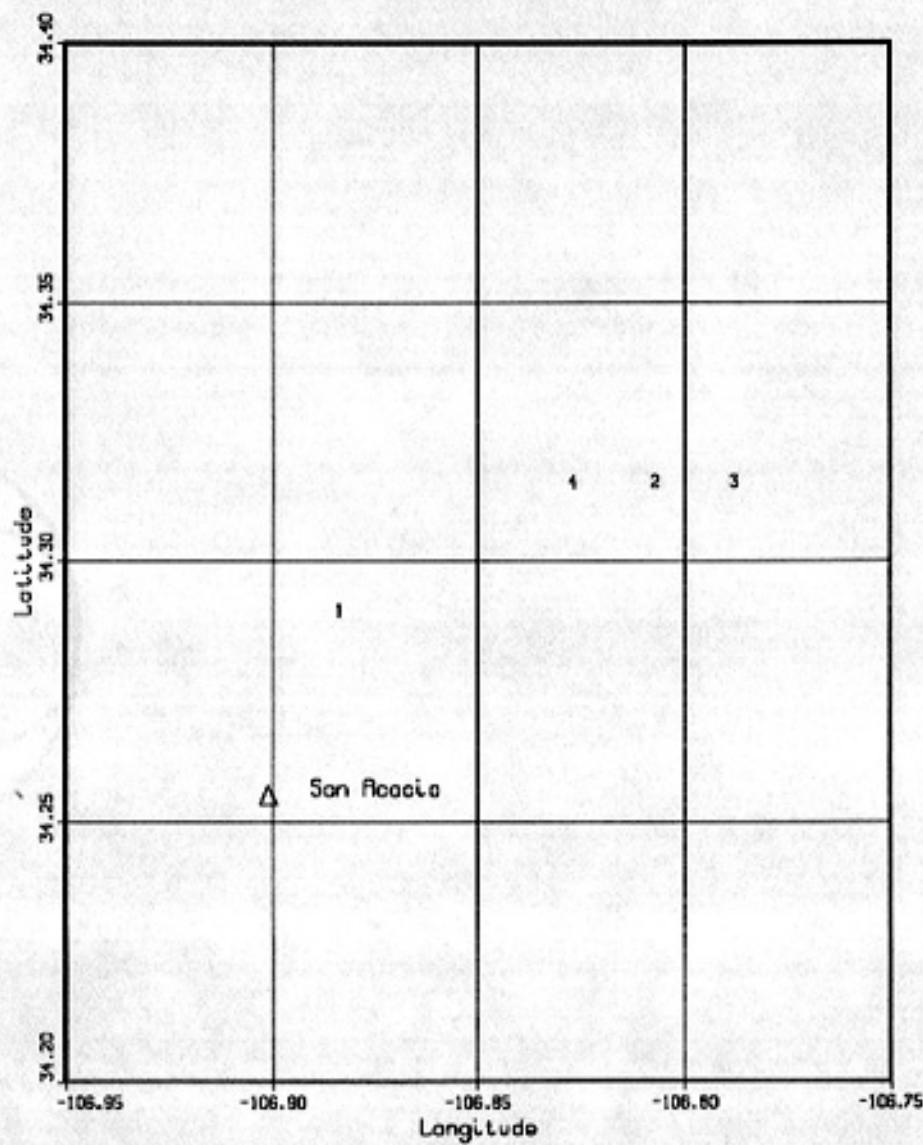
1982   10/26 to 11/10 Swarm
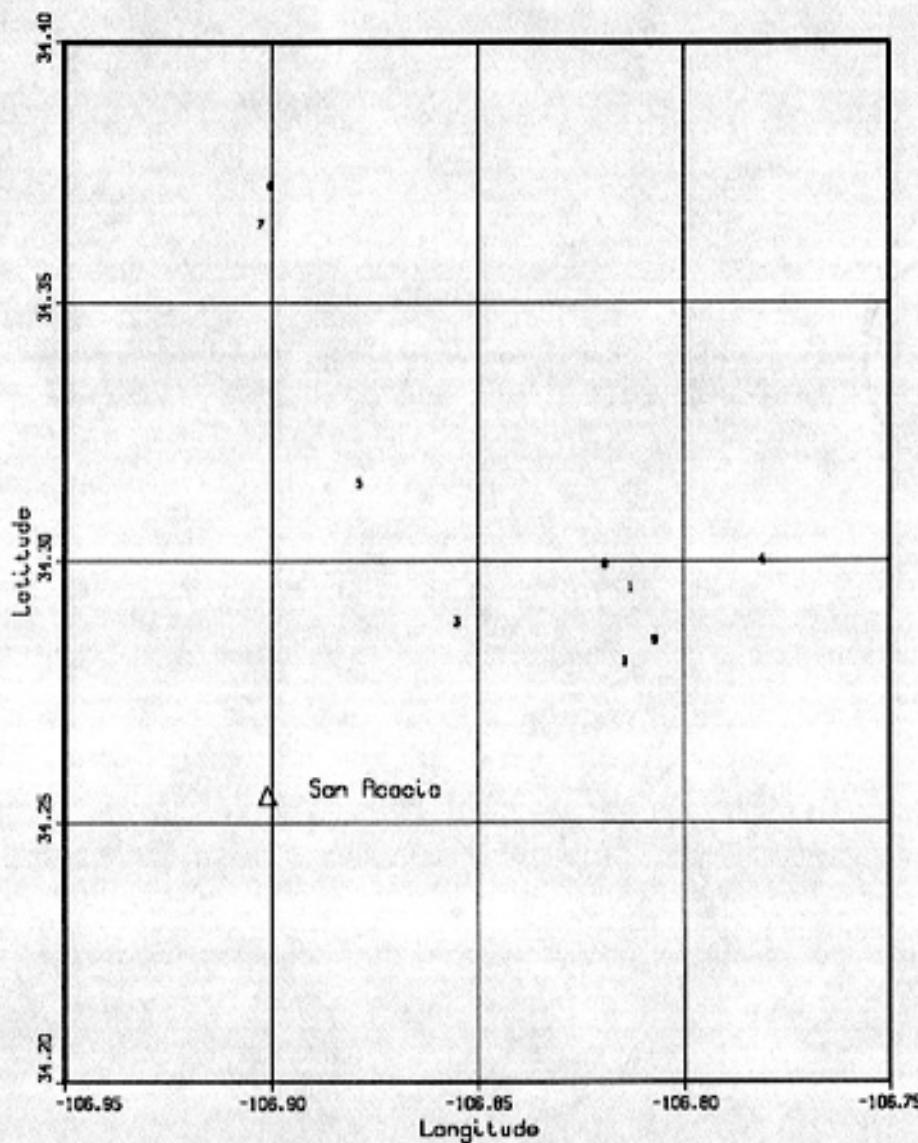
1982 11/17 to 12/11 Swarm
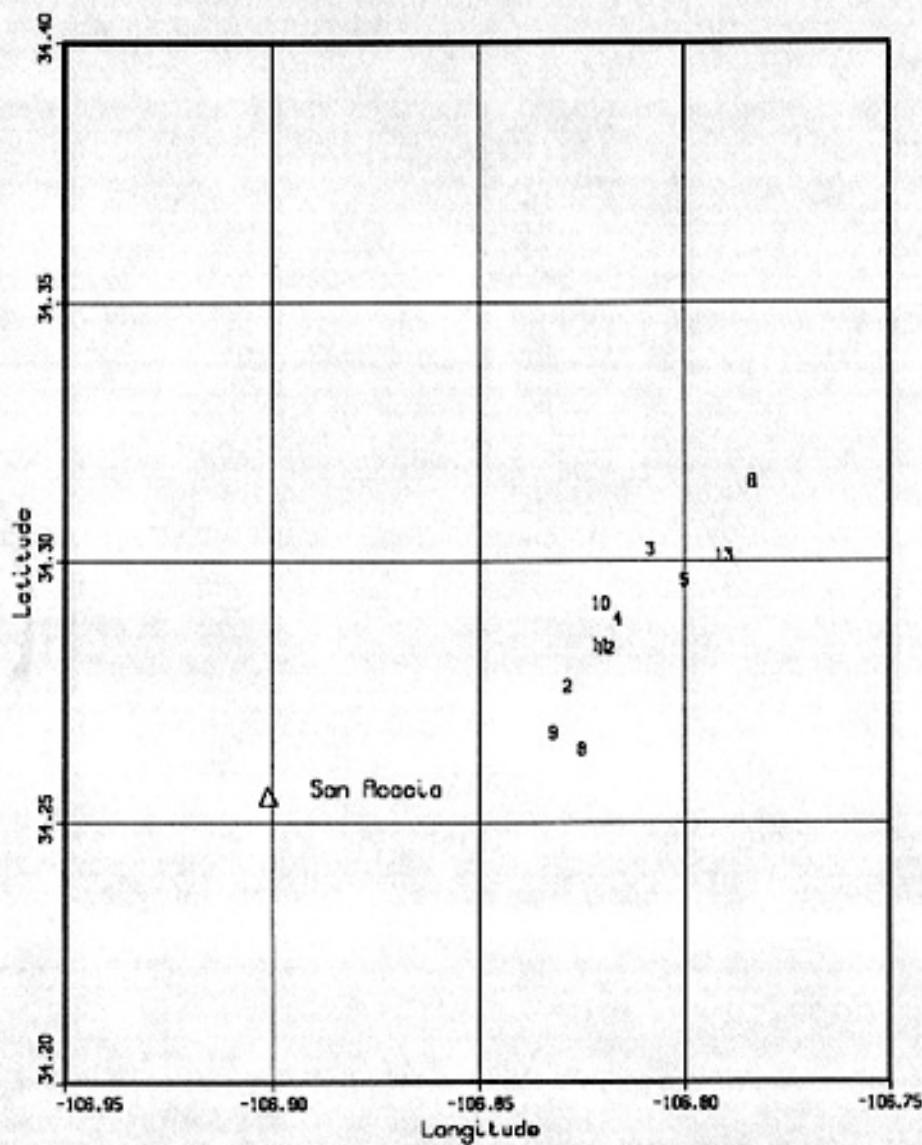
1982-83   12/30/82 to 1/2/83   Swarm

1983 1/9 to 1/17 Swarm

Plot showing earthquake swarm locations. Y-axis: Latitude (34.20 to 34.40). X-axis: Longitude (-106.95 to -106.75). Data points labeled 4, 1, 2, 3 and a triangle marker labeled "San Acacia".
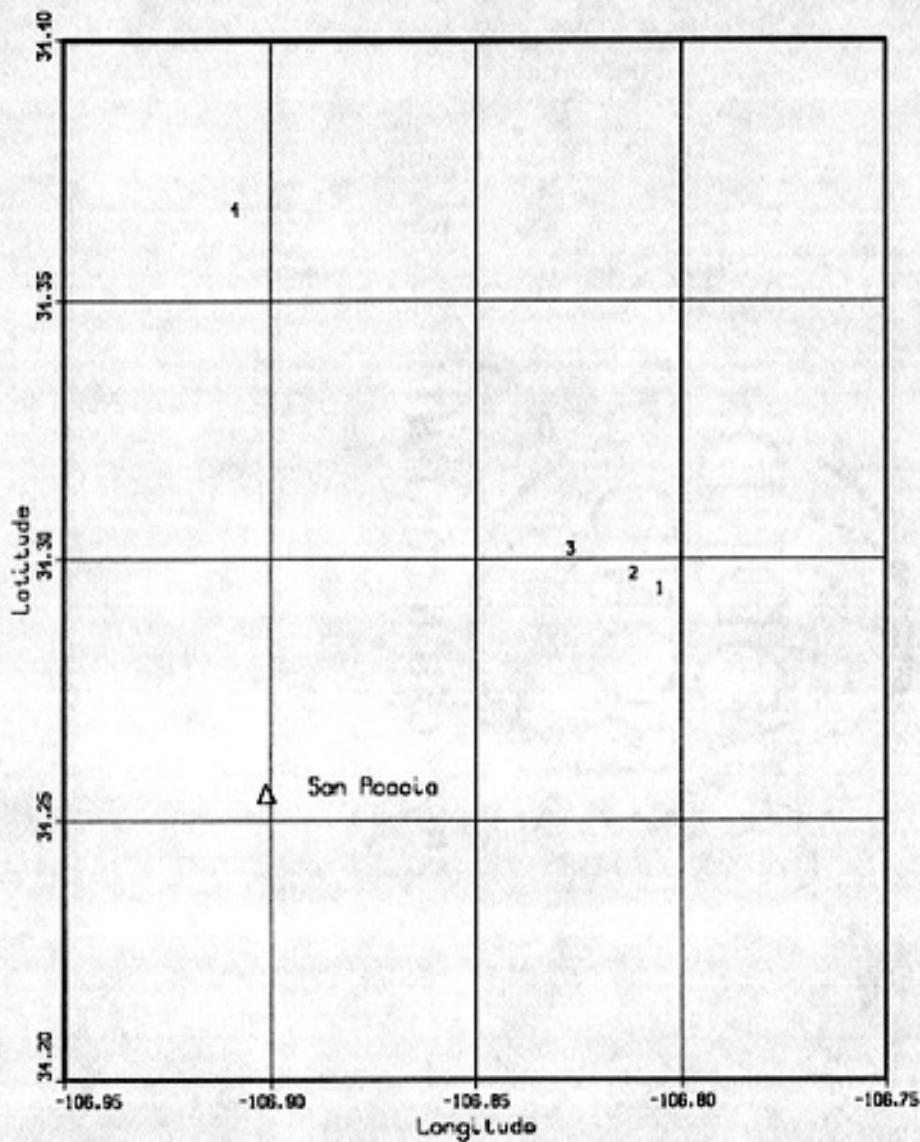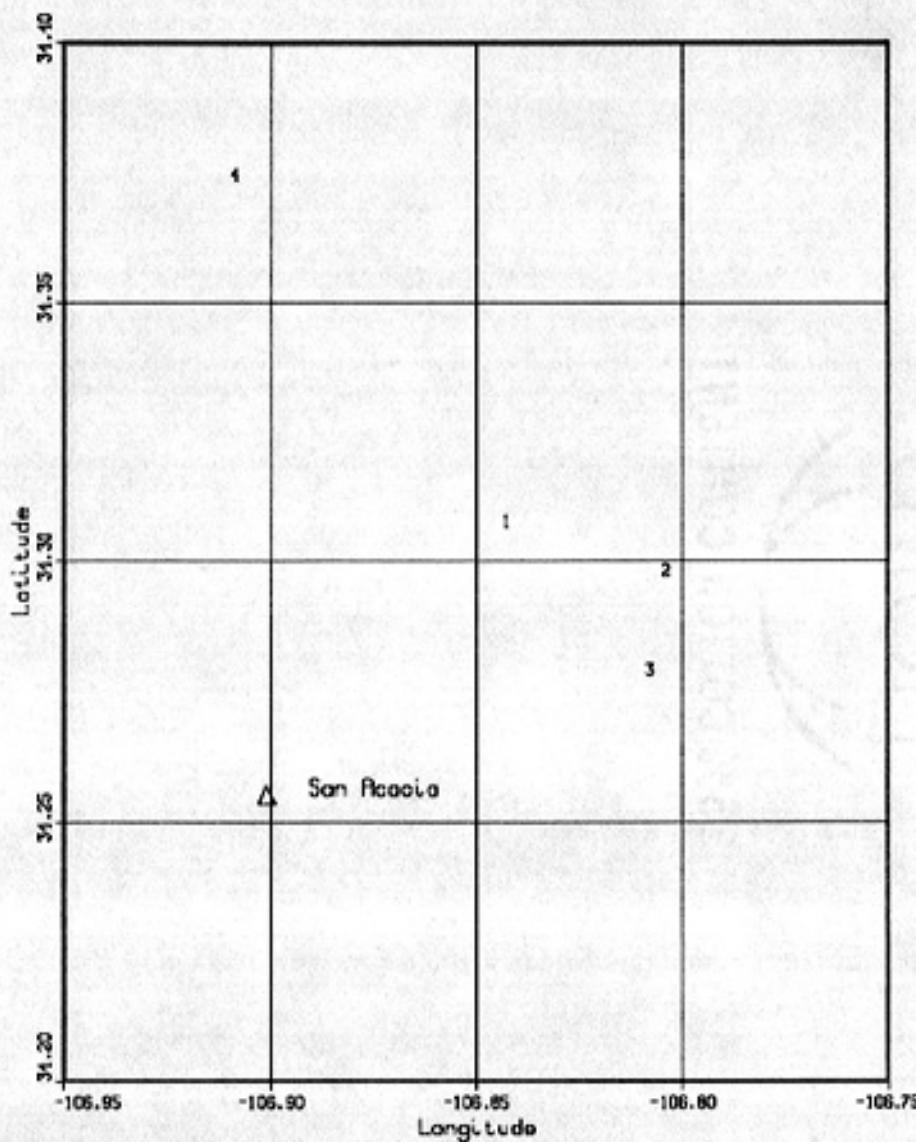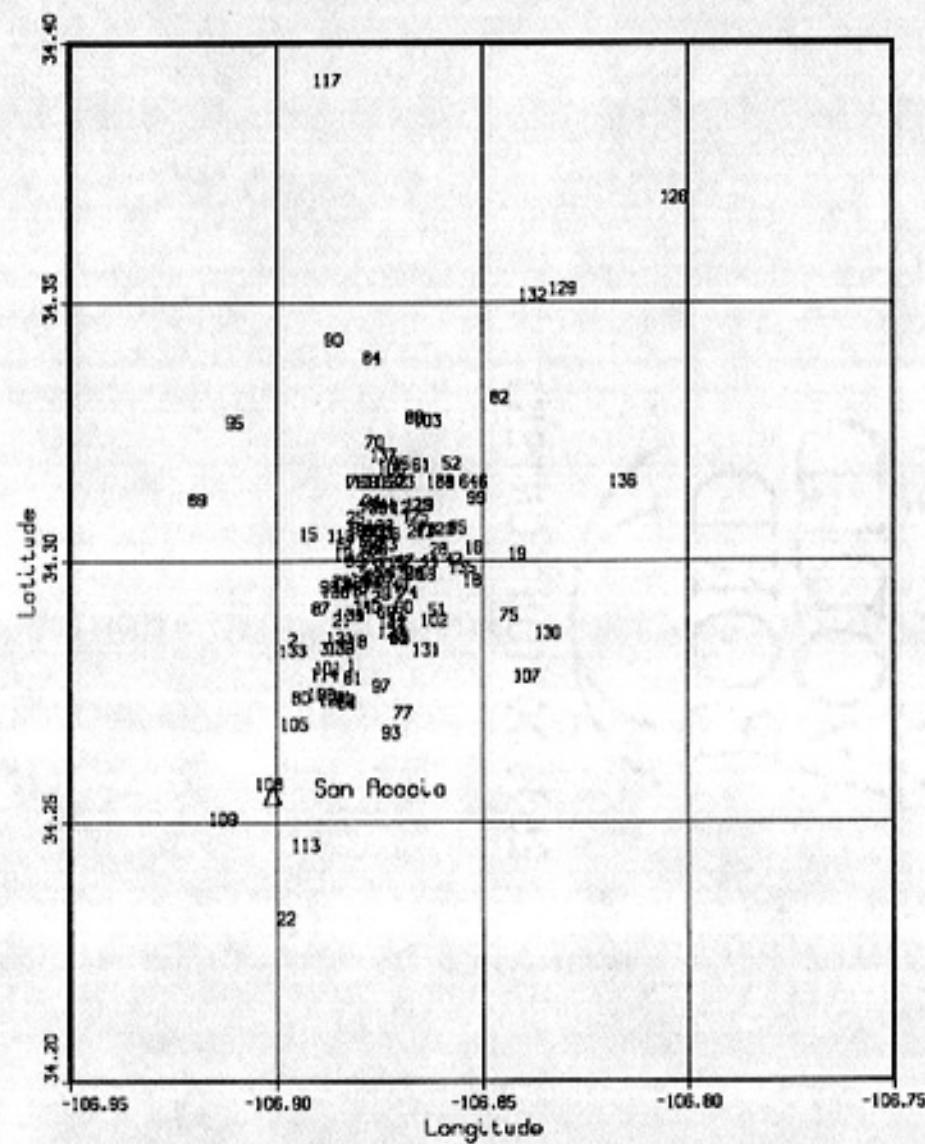
1983 2/25 to 5/7 Swarm

1983   2/25 to 2/26 part of large swarm
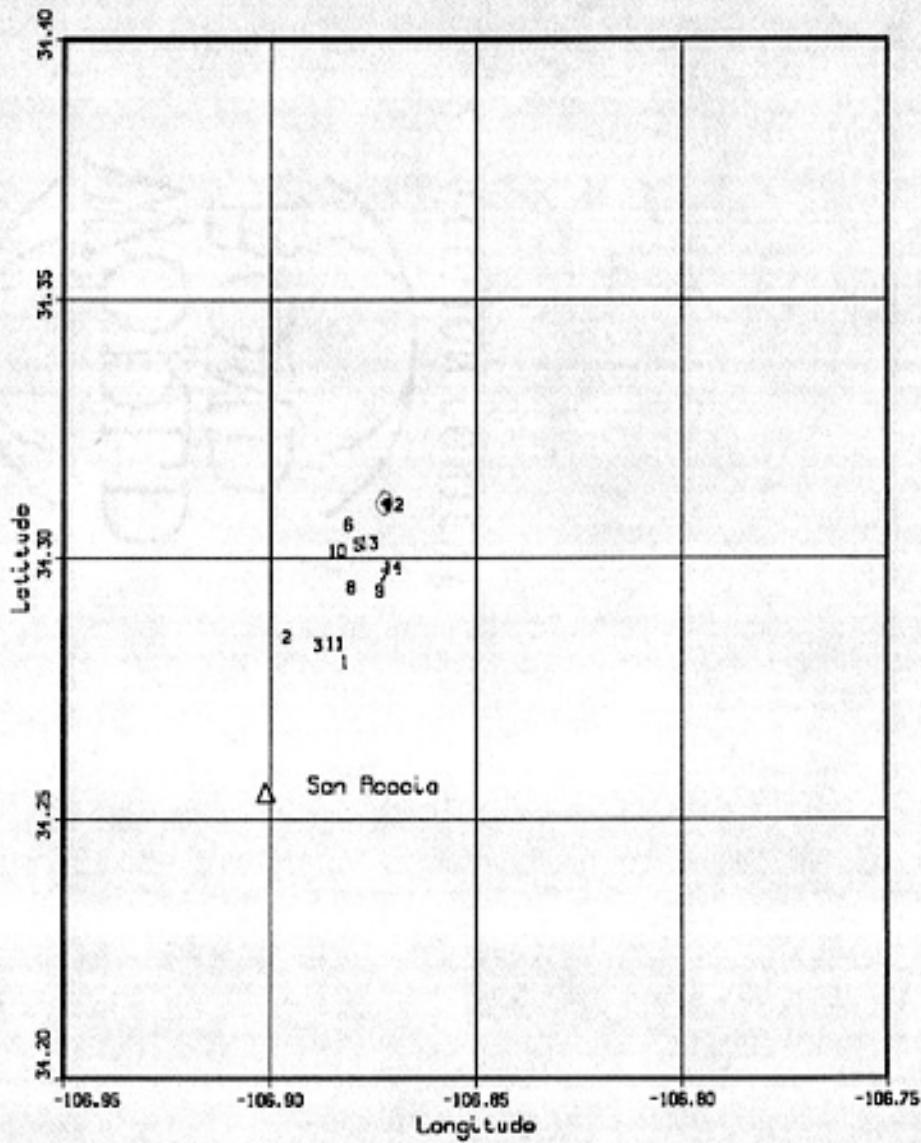
1983 2/27 to 3/3 part of Large swarm
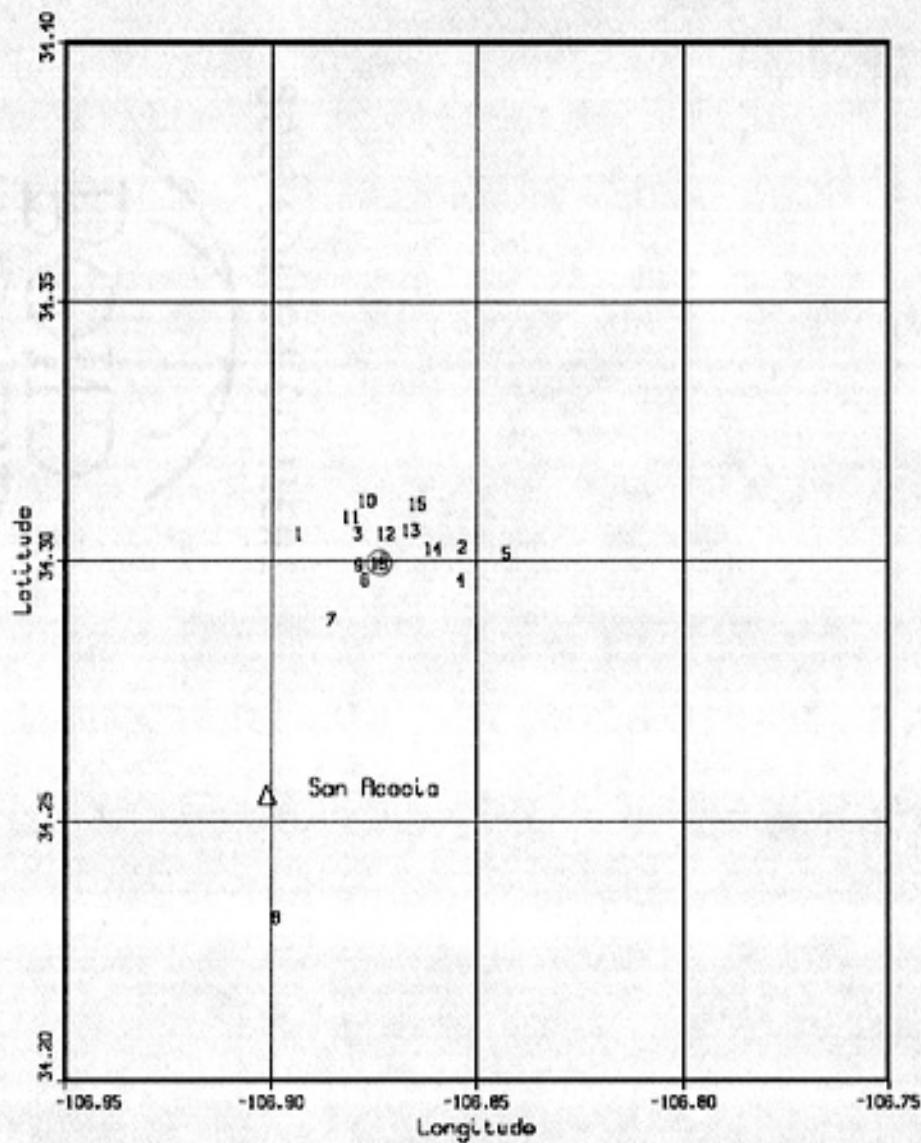
1983 3/4 port of Large swarm
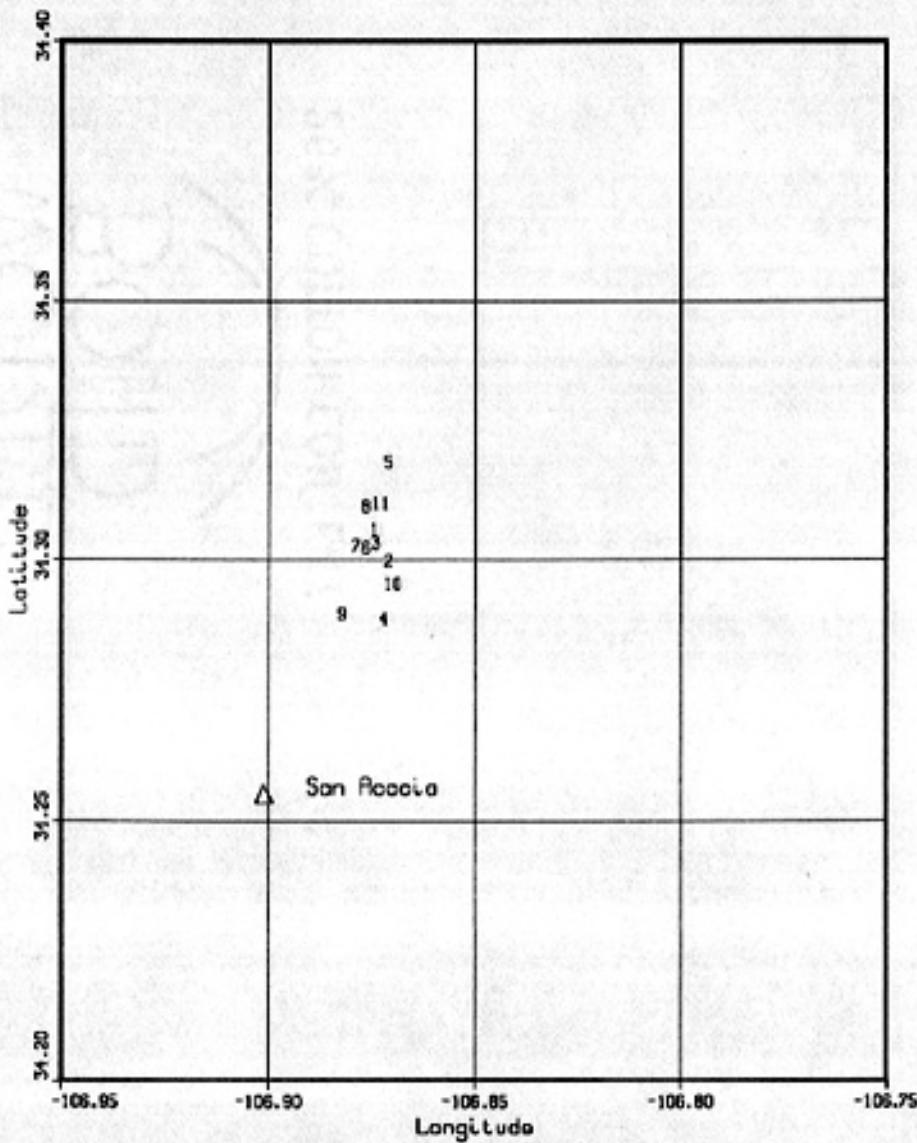
1983   3/5 to 3/11 part of large swarm
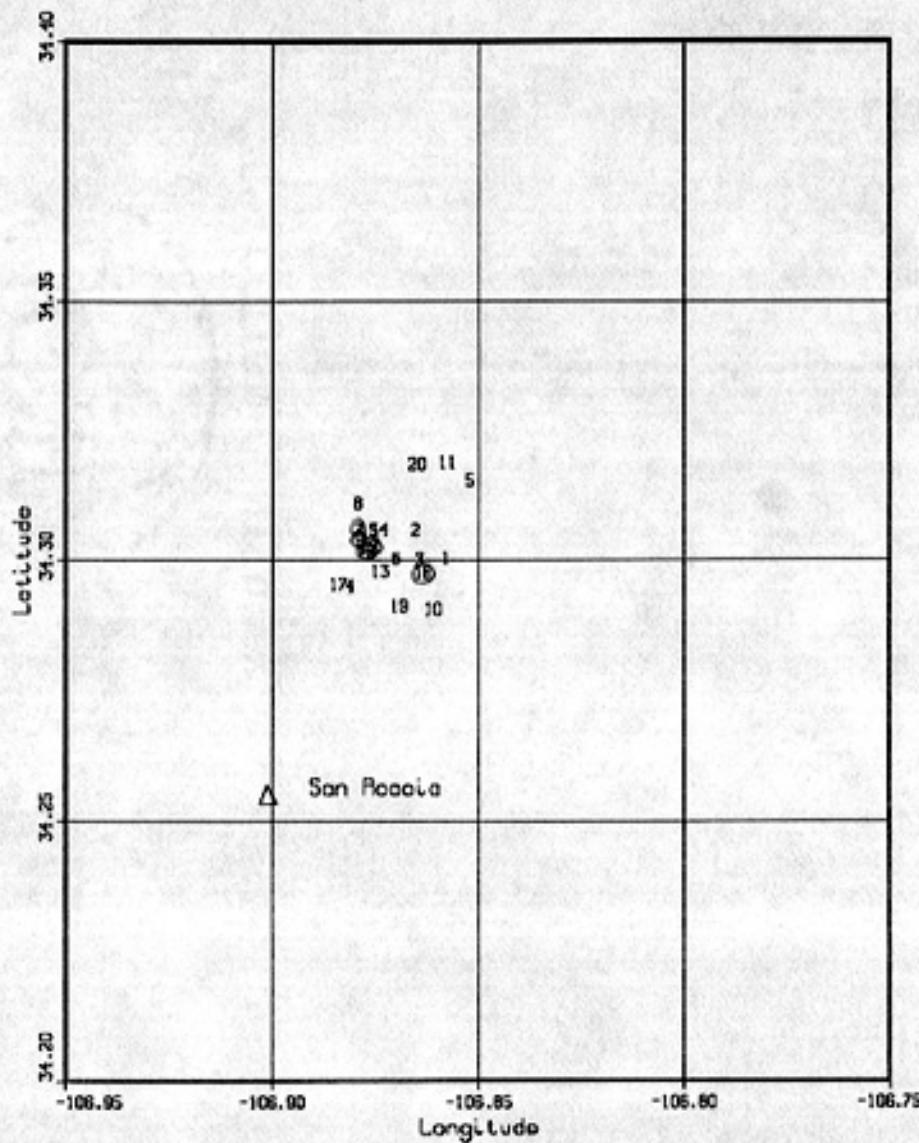
1983 3/12 to 3/23 part of large swarm
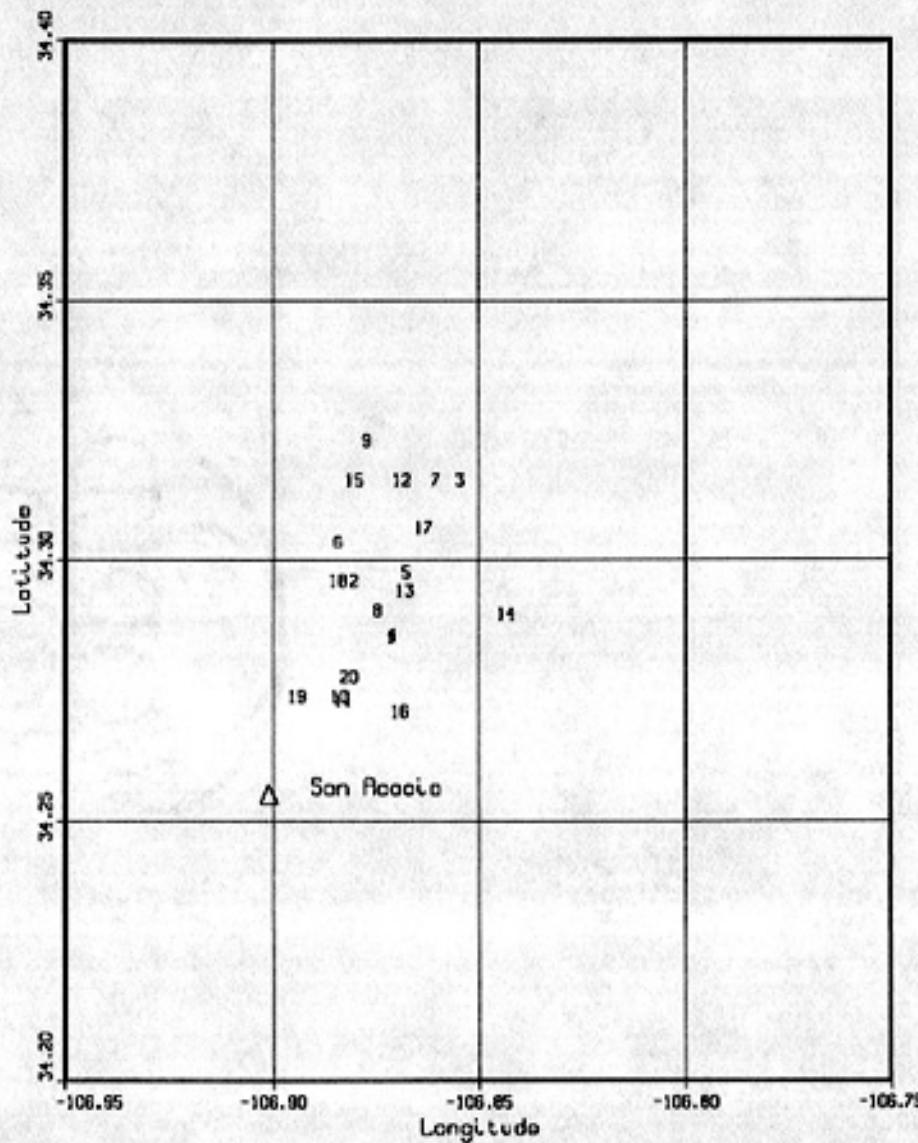
1983   3/24 to 4/5 part of large swarm
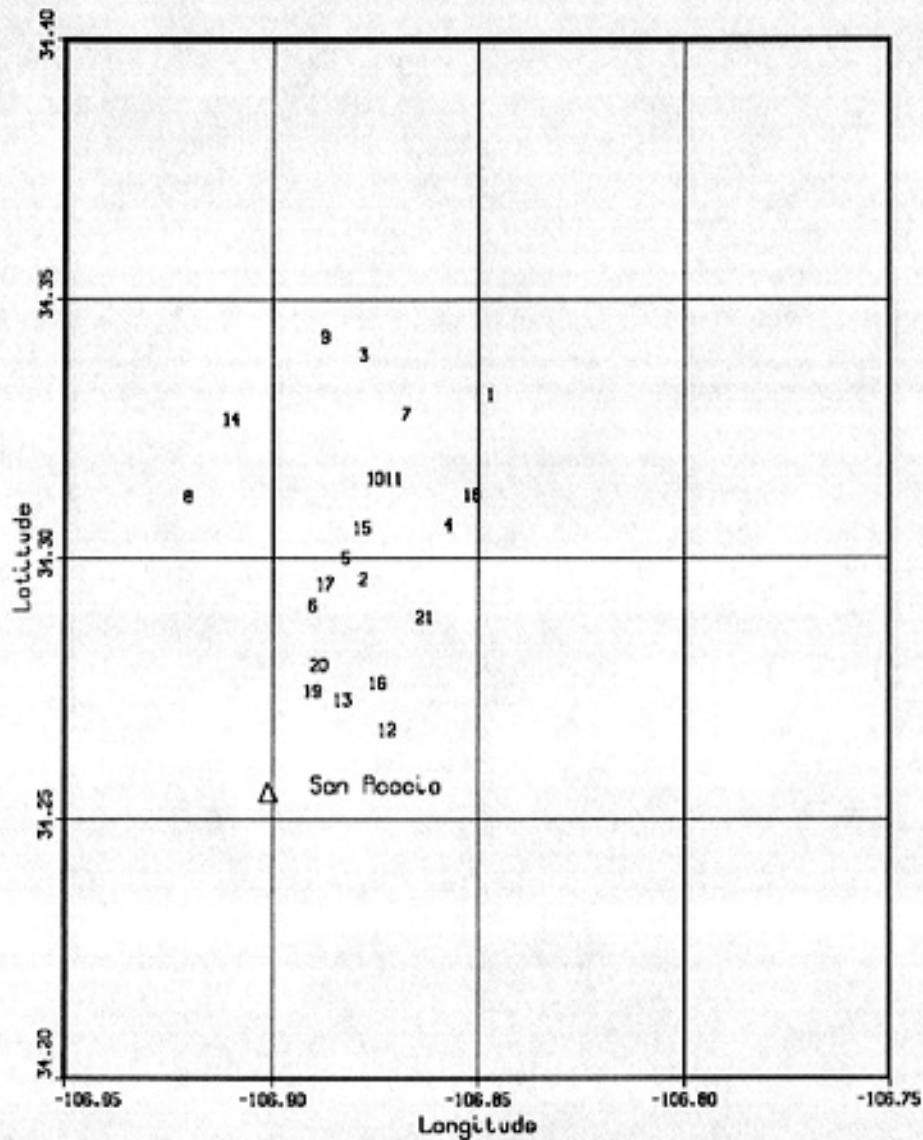
1983 4/8 to 4/18 part of large swarm
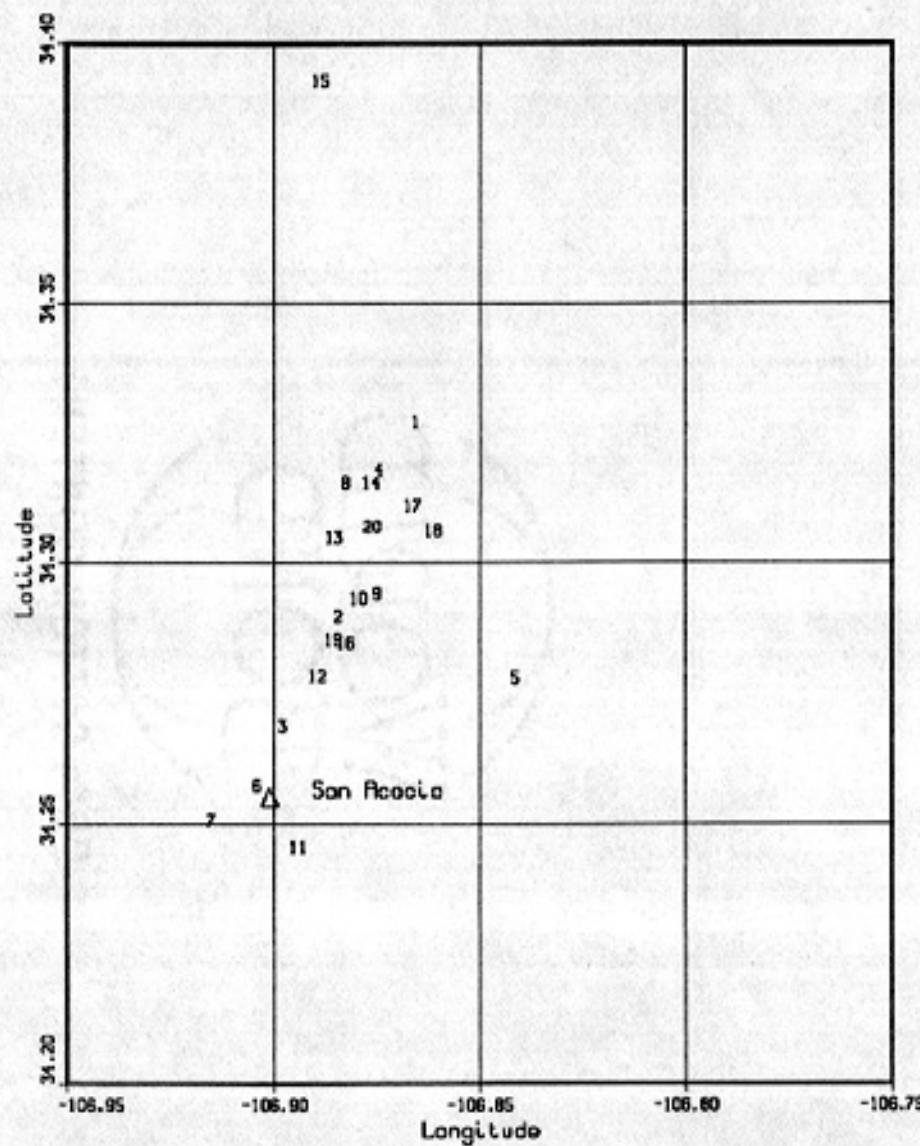
1983 4/20 to 5/7 port of large sworm
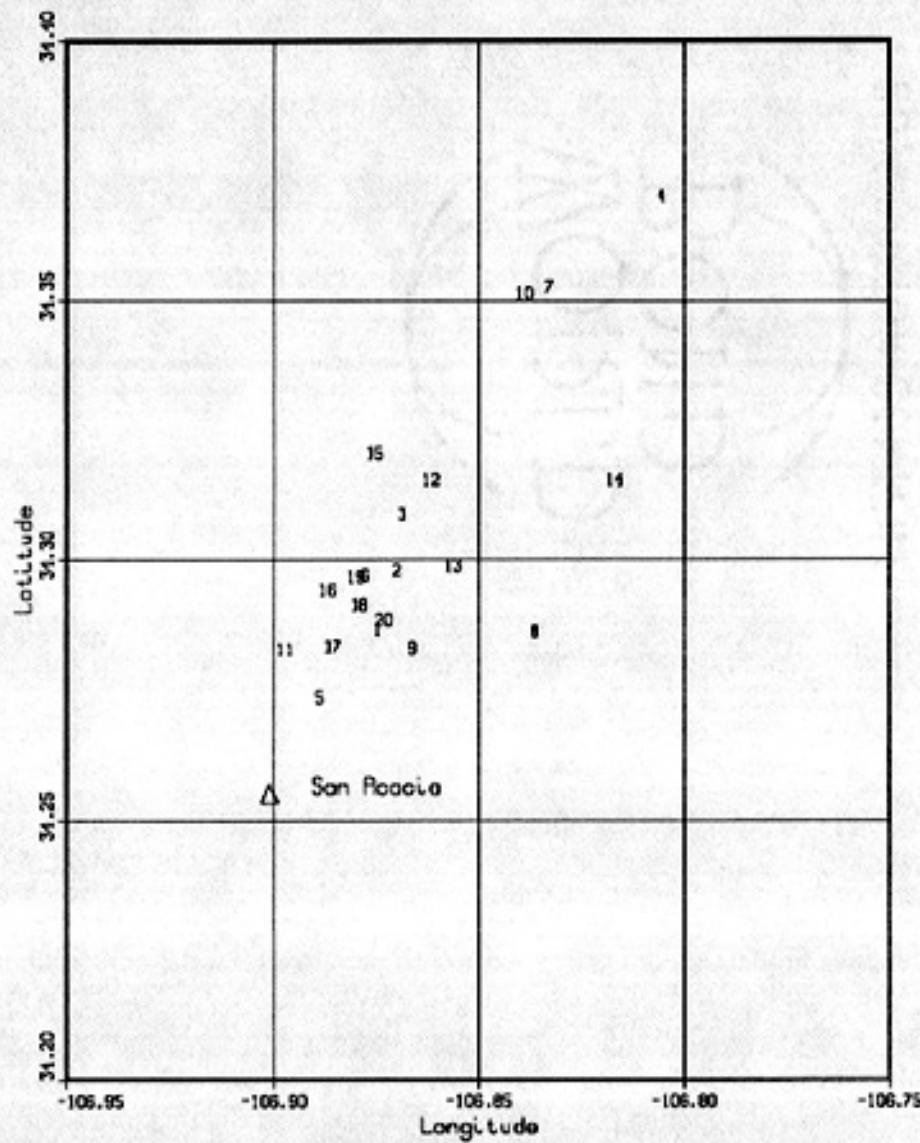
1983 5/15 to 6/4 Swarm
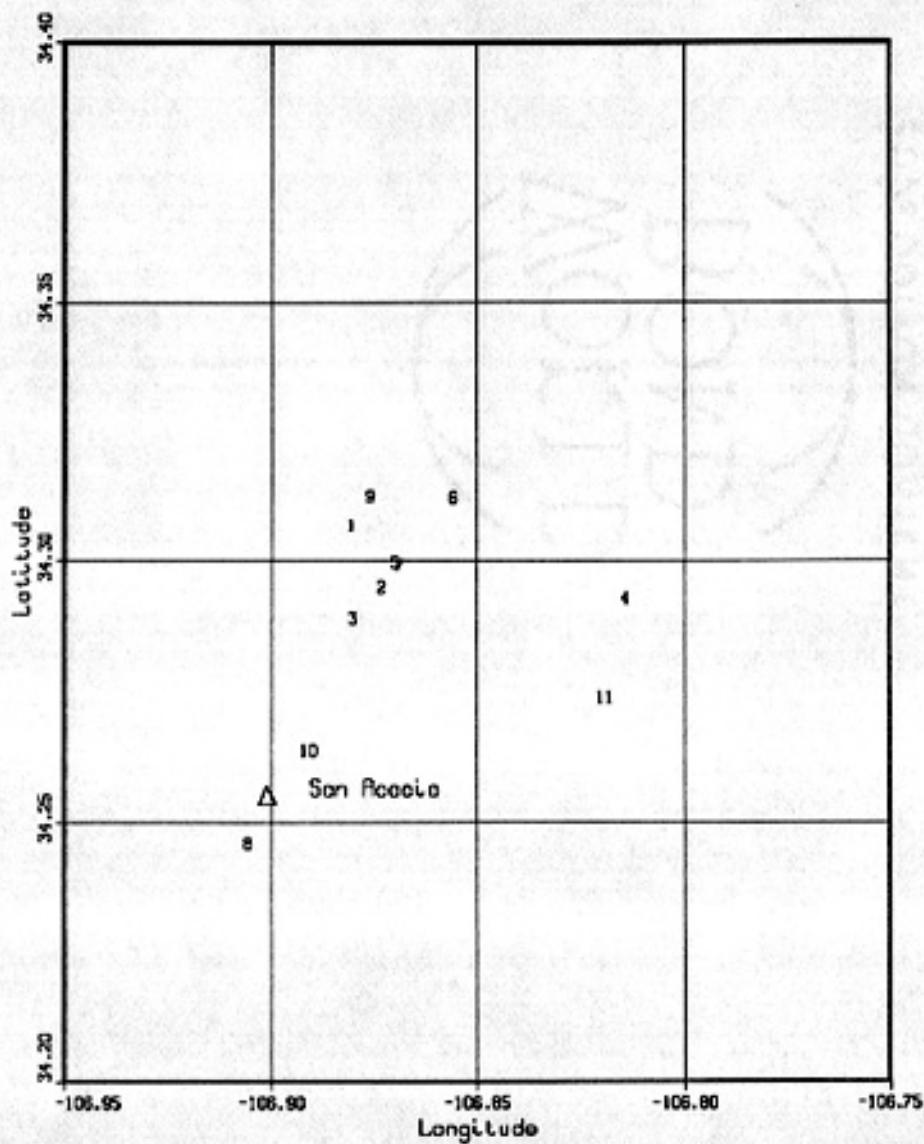
1983 7/1 to 7/8 Swarm
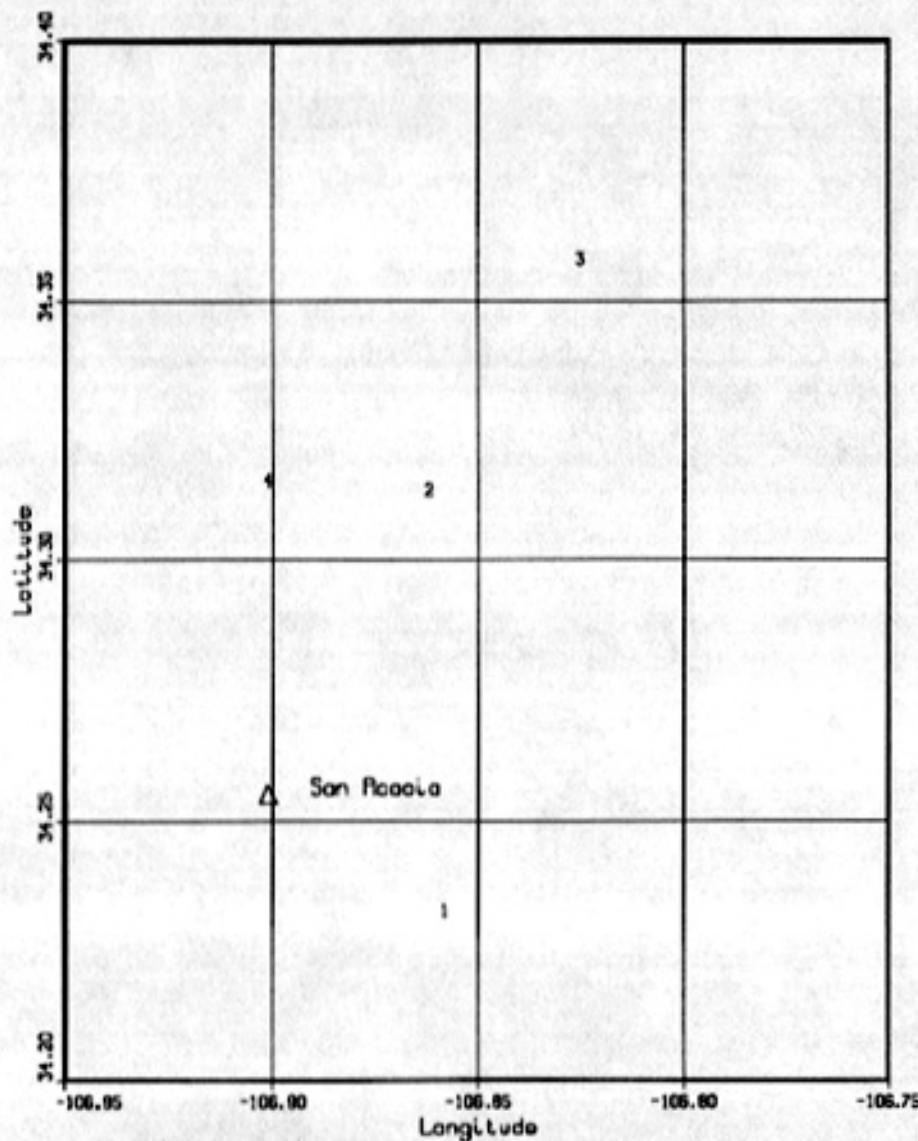
1983 7/6 to 7/9 Swarm
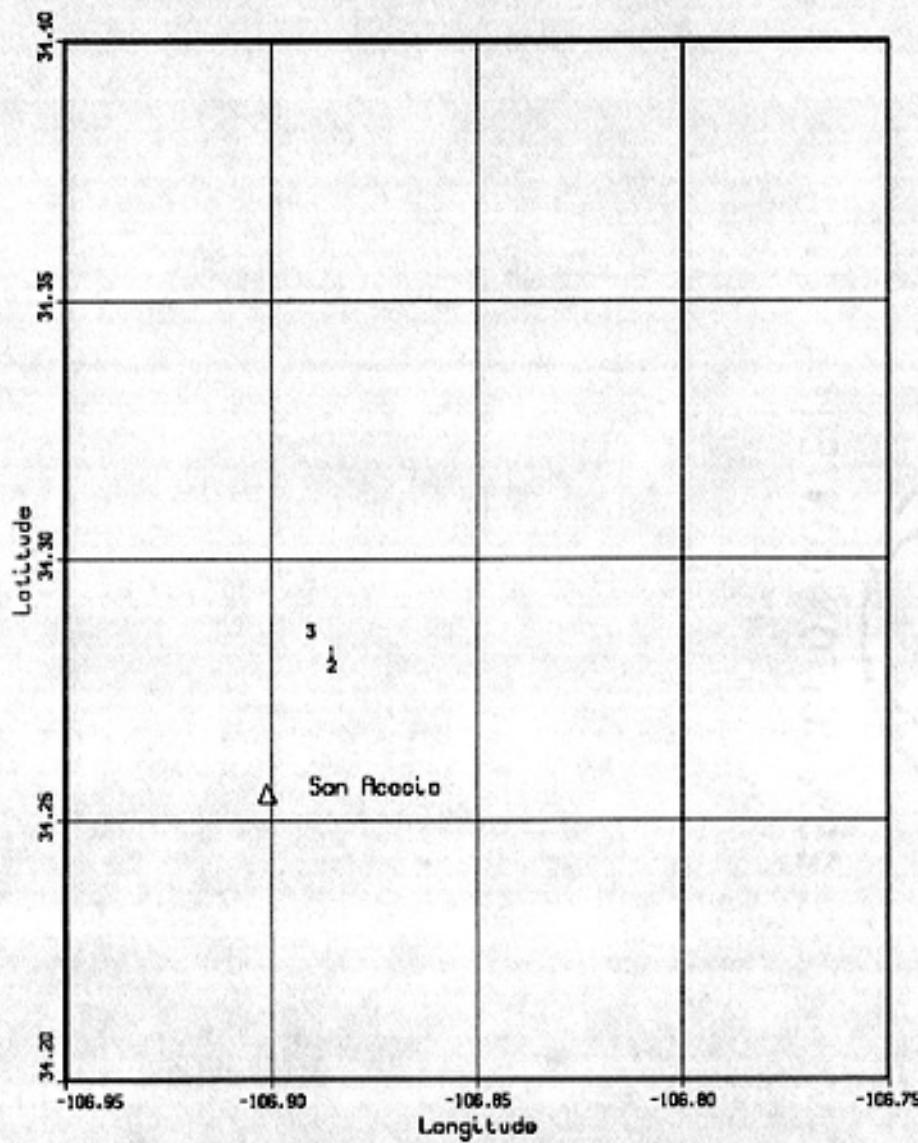
1984   4/14 to 4/30   Swarm
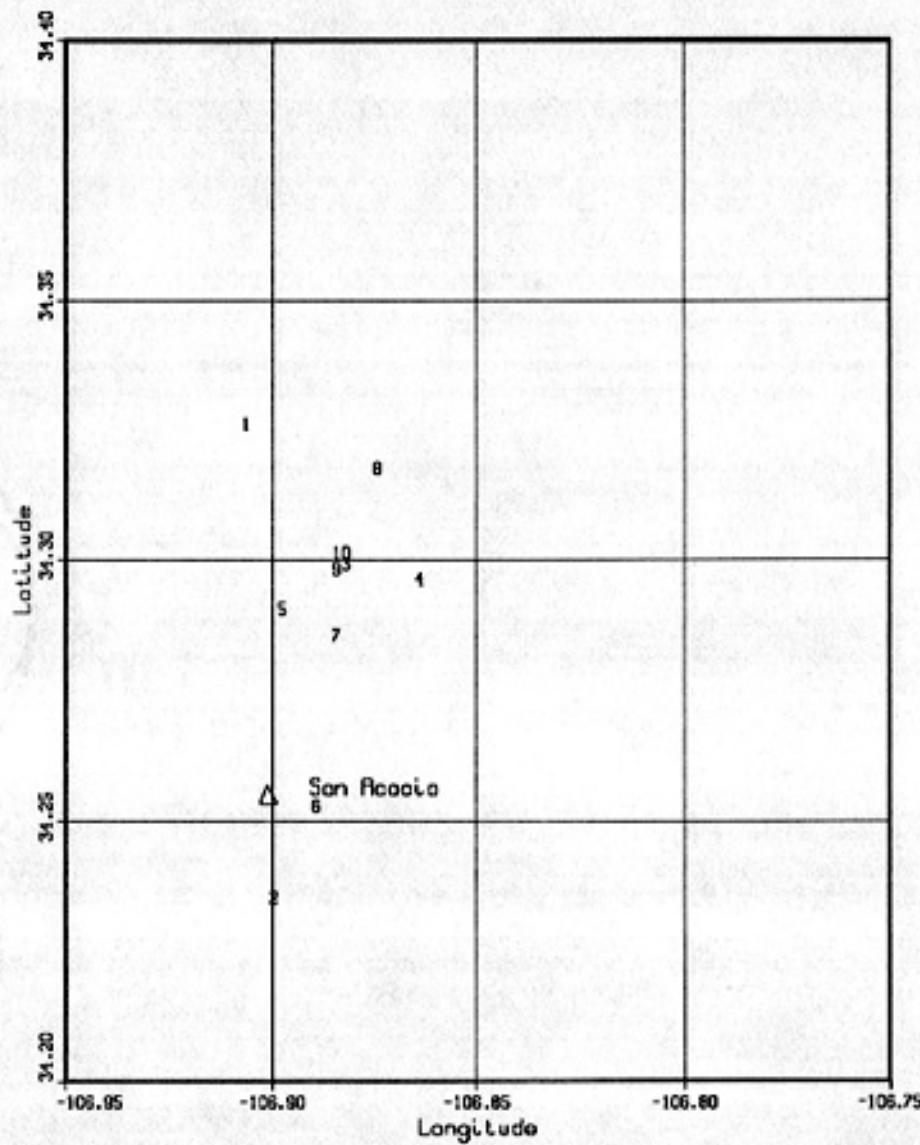
1984   4/18 to 4/29   Swarm
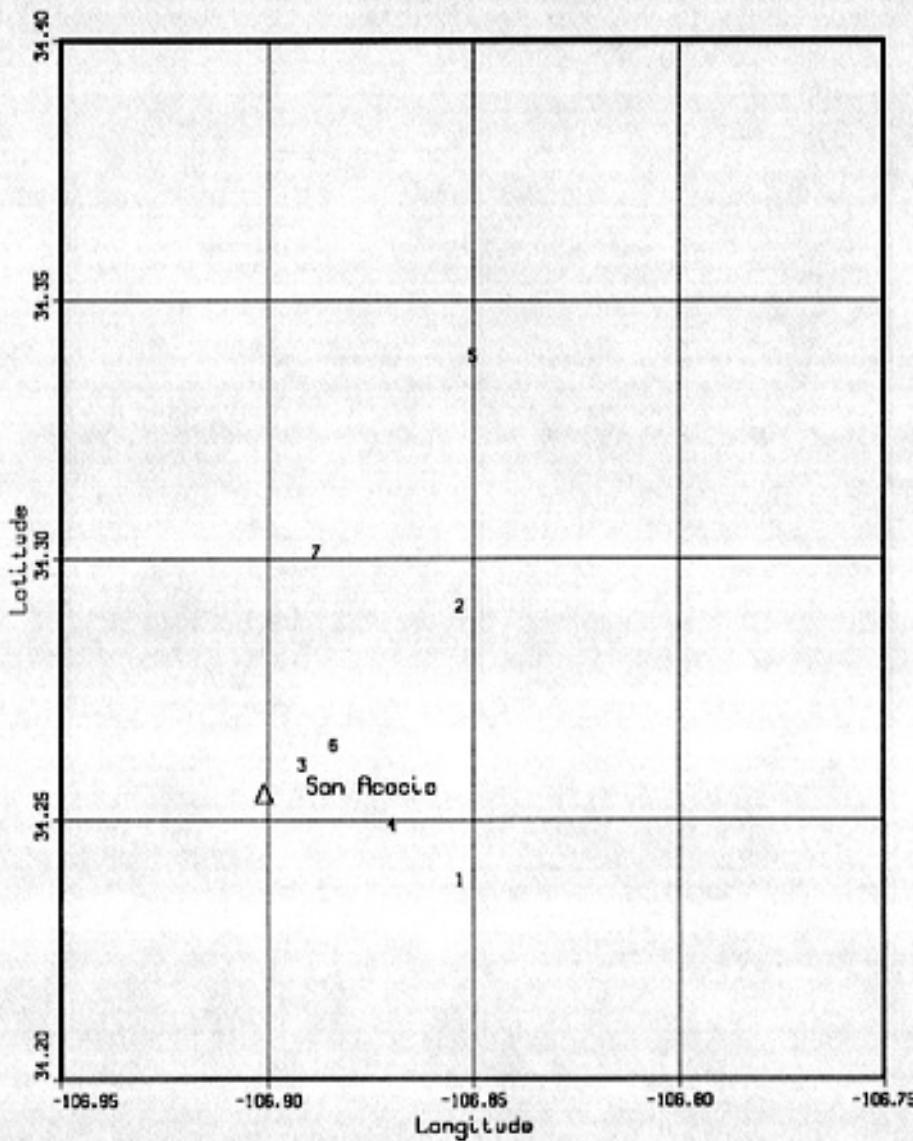
1984 5/25 to 5/30 Swarm
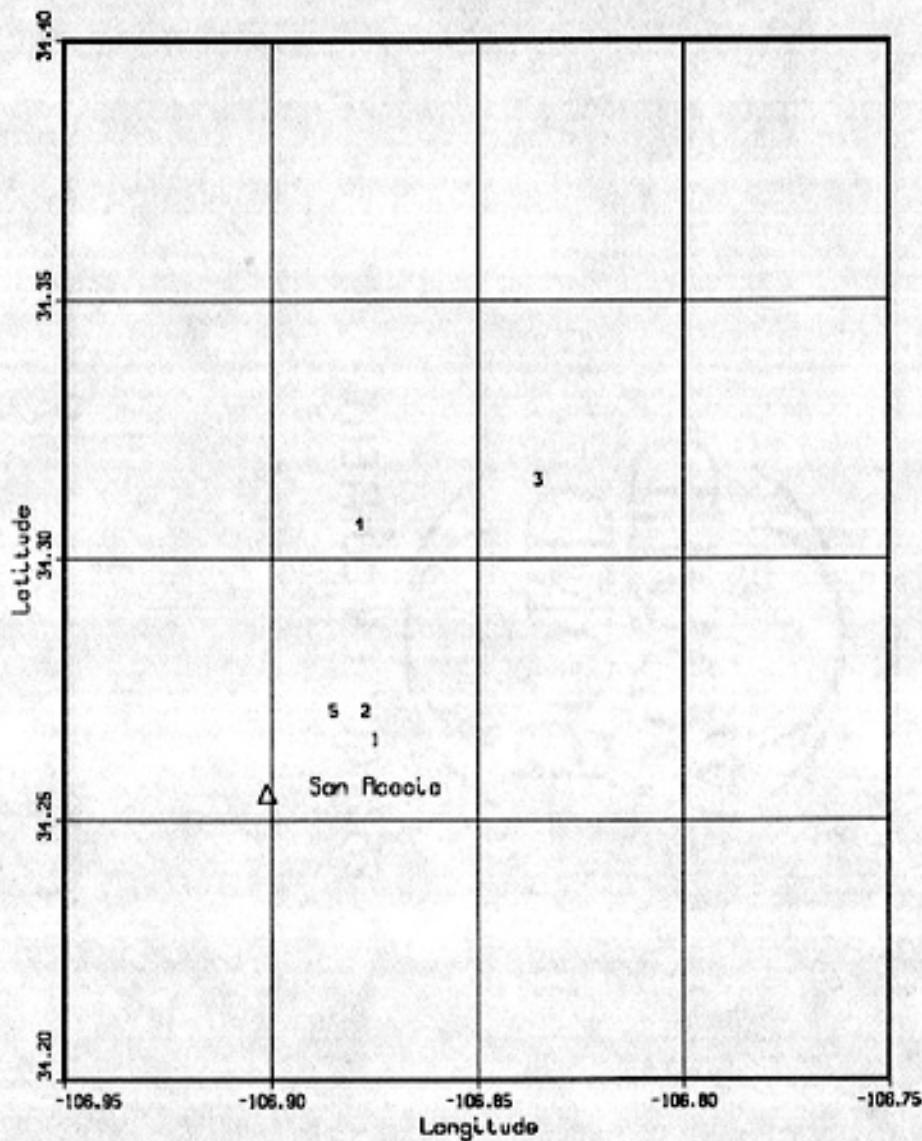
1984 9/3 to 9/19 Swarm

1985 1/10 to 1/12 Swarm

Latitude

34.40 —

34.35 —

34.30 —

34.25 —   2
                                  △ San Acacia

34.20 —   3   1

-106.95   -106.90   -106.85   -106.80   -106.75

Longitude

5
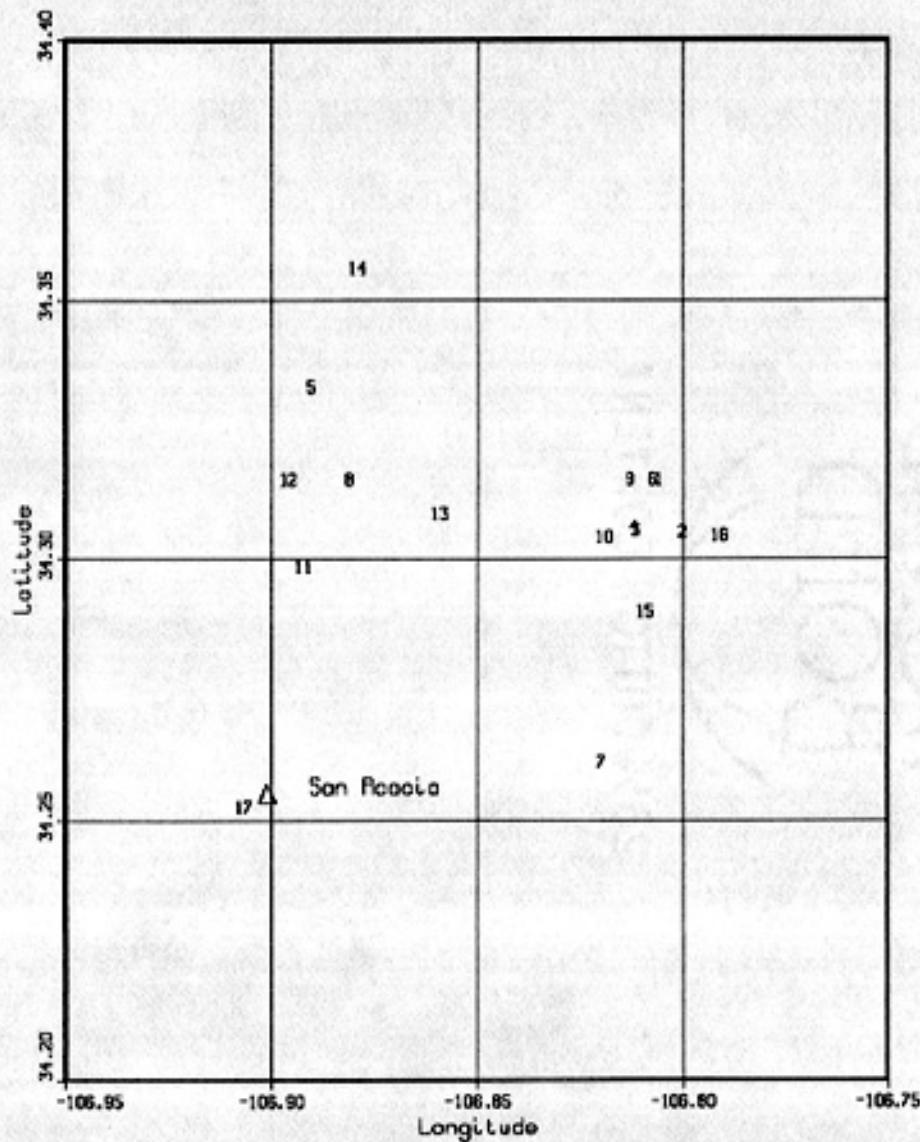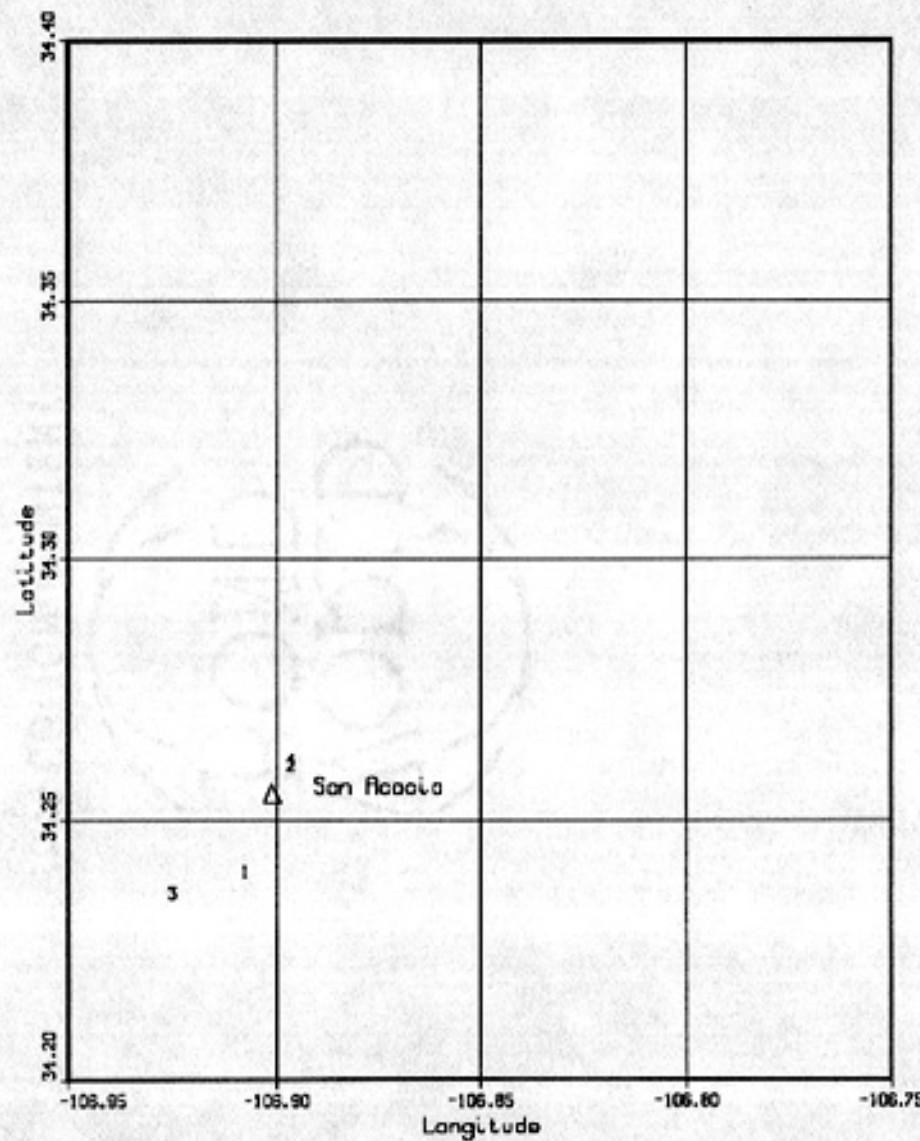
1985   3/16 to 3/20   Swarm
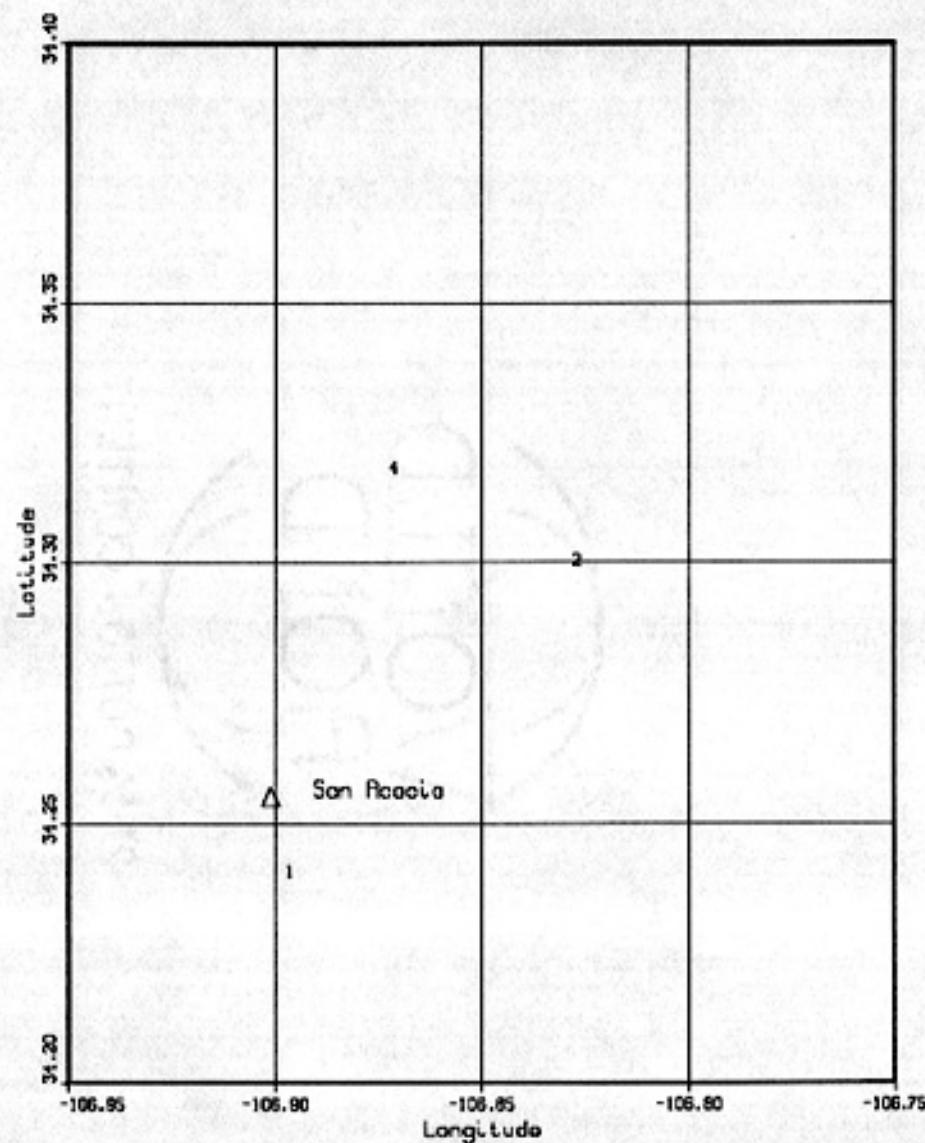
1985 4/3 to 4/11 Swarm
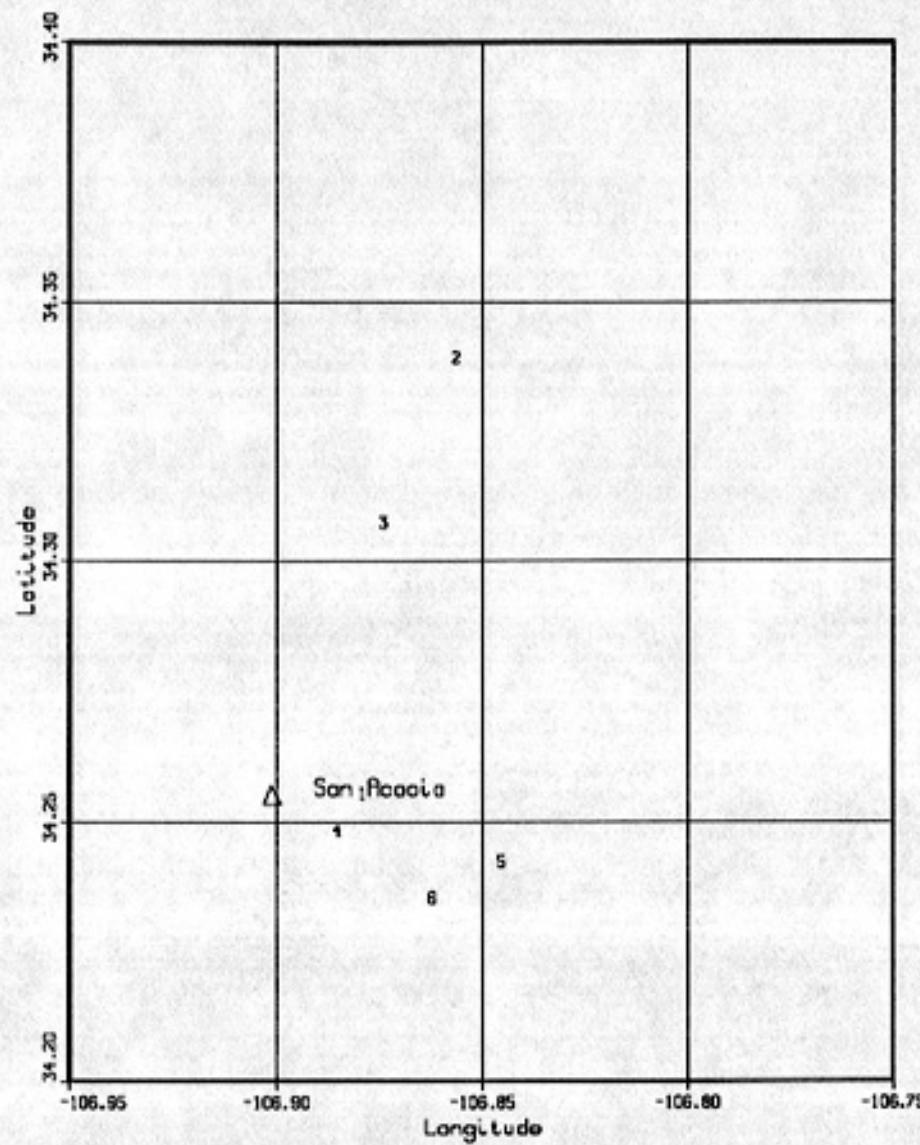
1985 6/12 to 6/24 Swarm
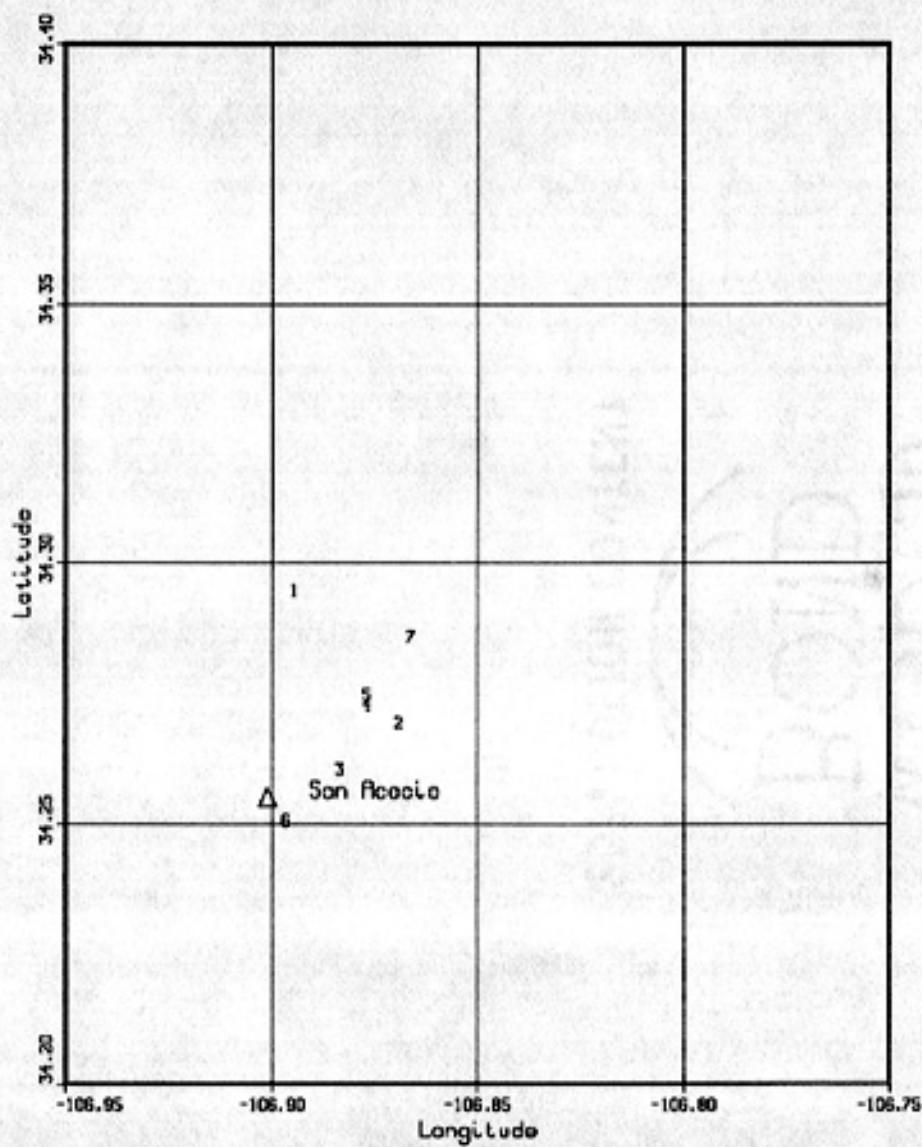
1985 7/9 to 7/19 Swarm
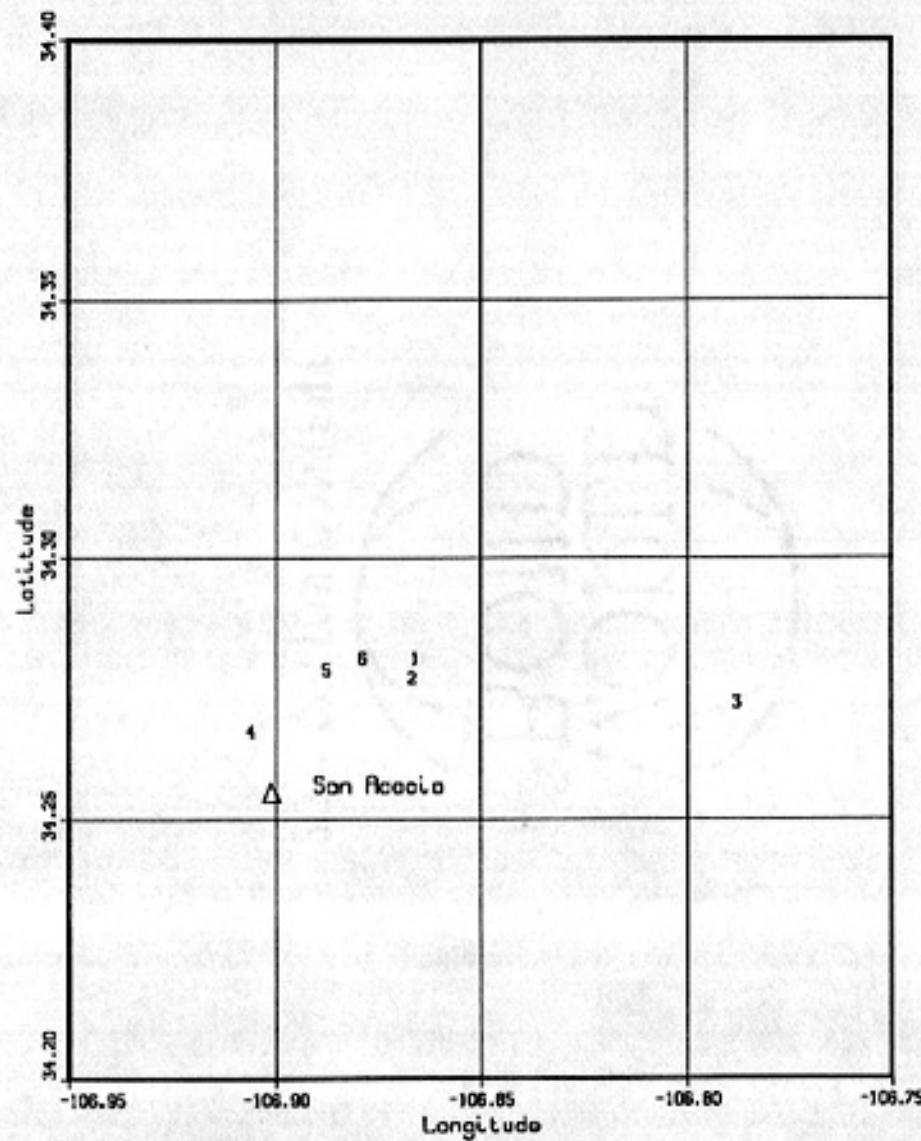
1985   8/8 to 8/16   Swarm
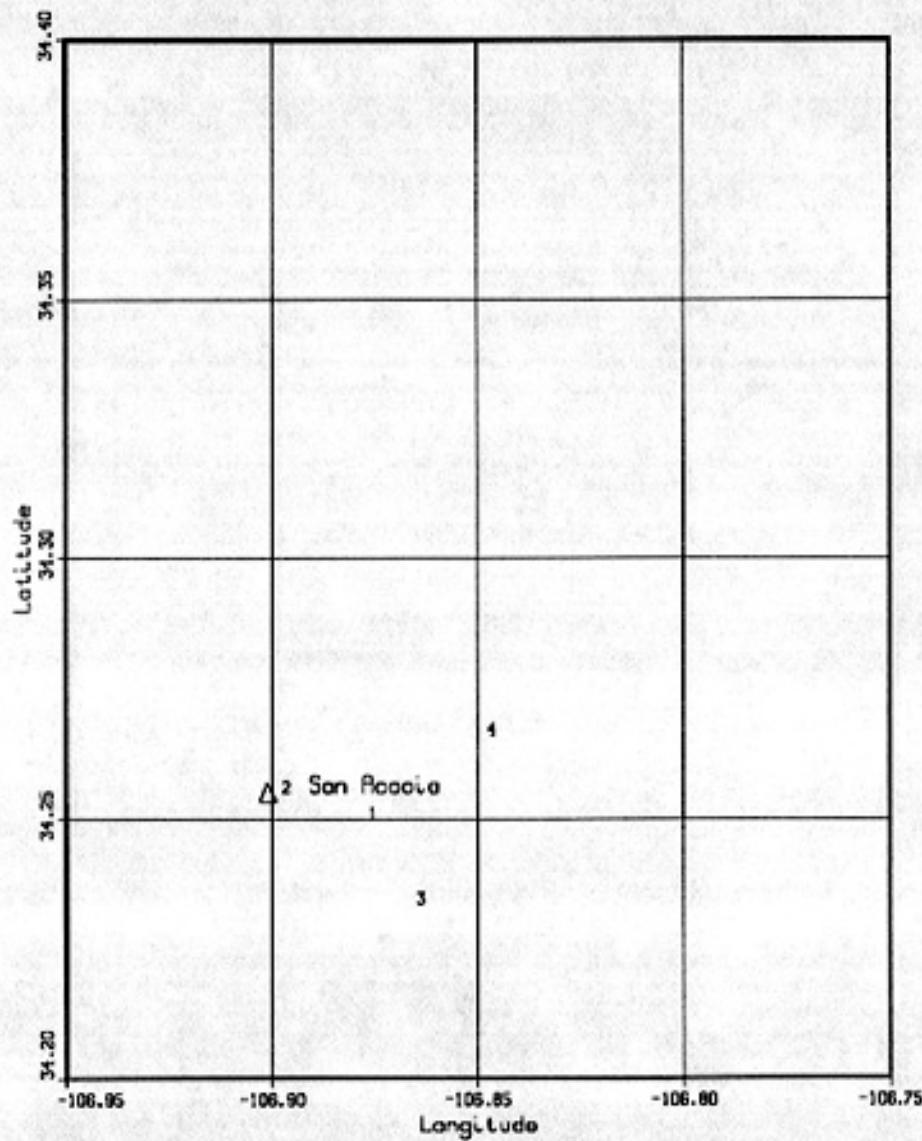
1985 9/21 to 10/6 Swarm
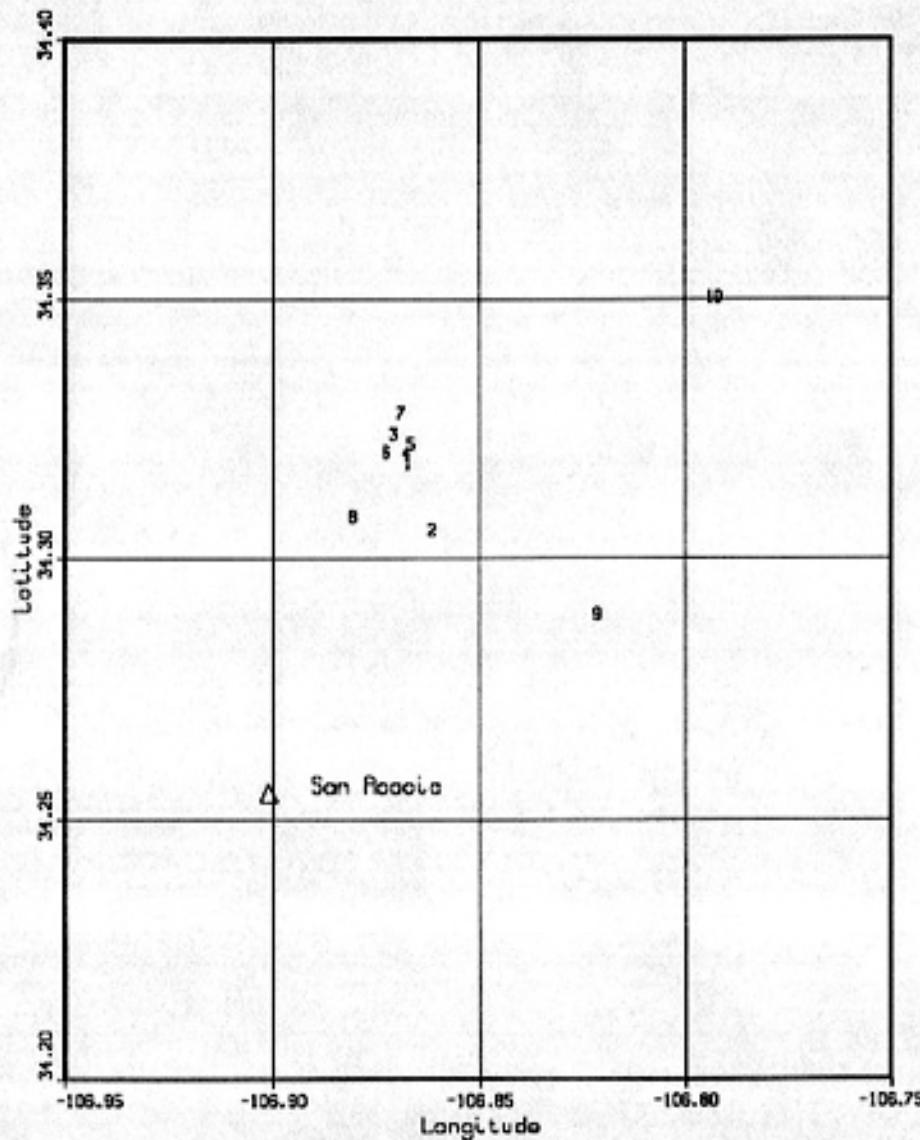
1985   10/18 to 11/10   Swarm
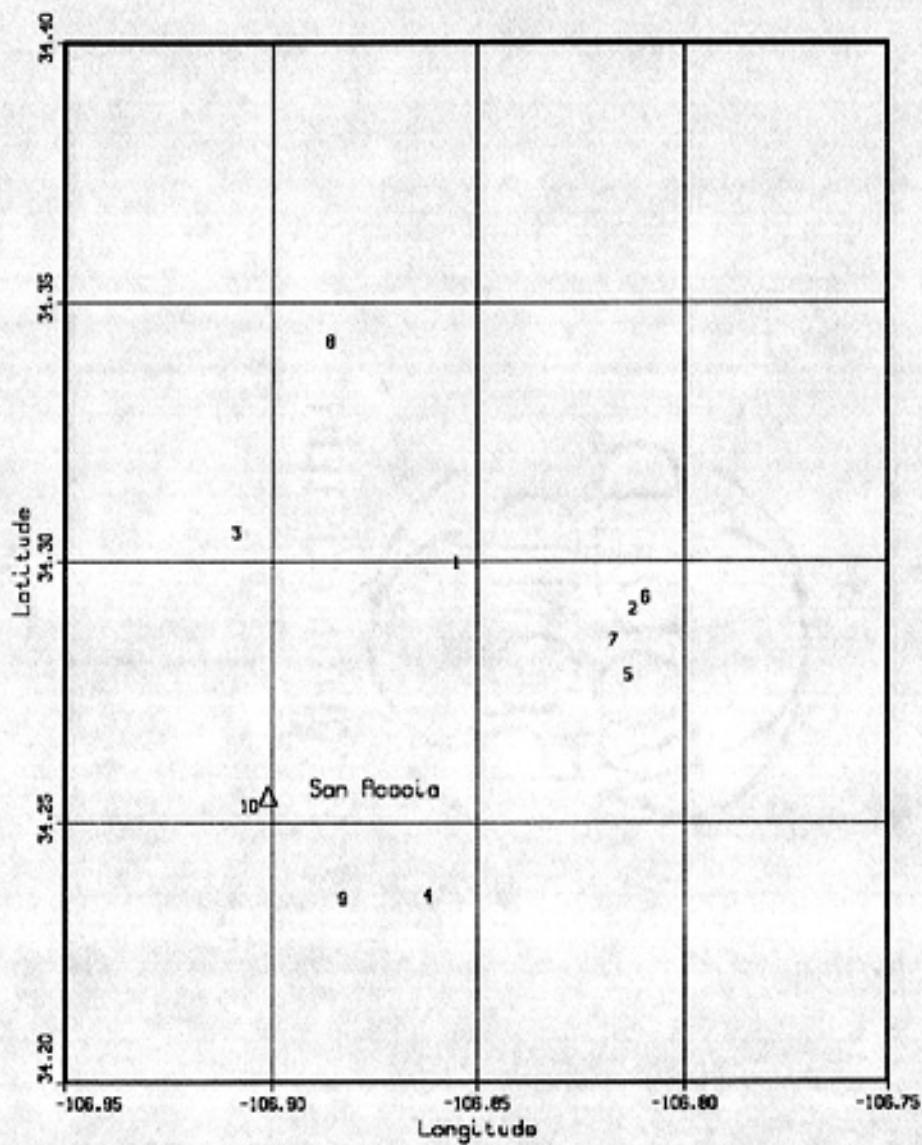
1985   12/13 to 12/15   Swarm
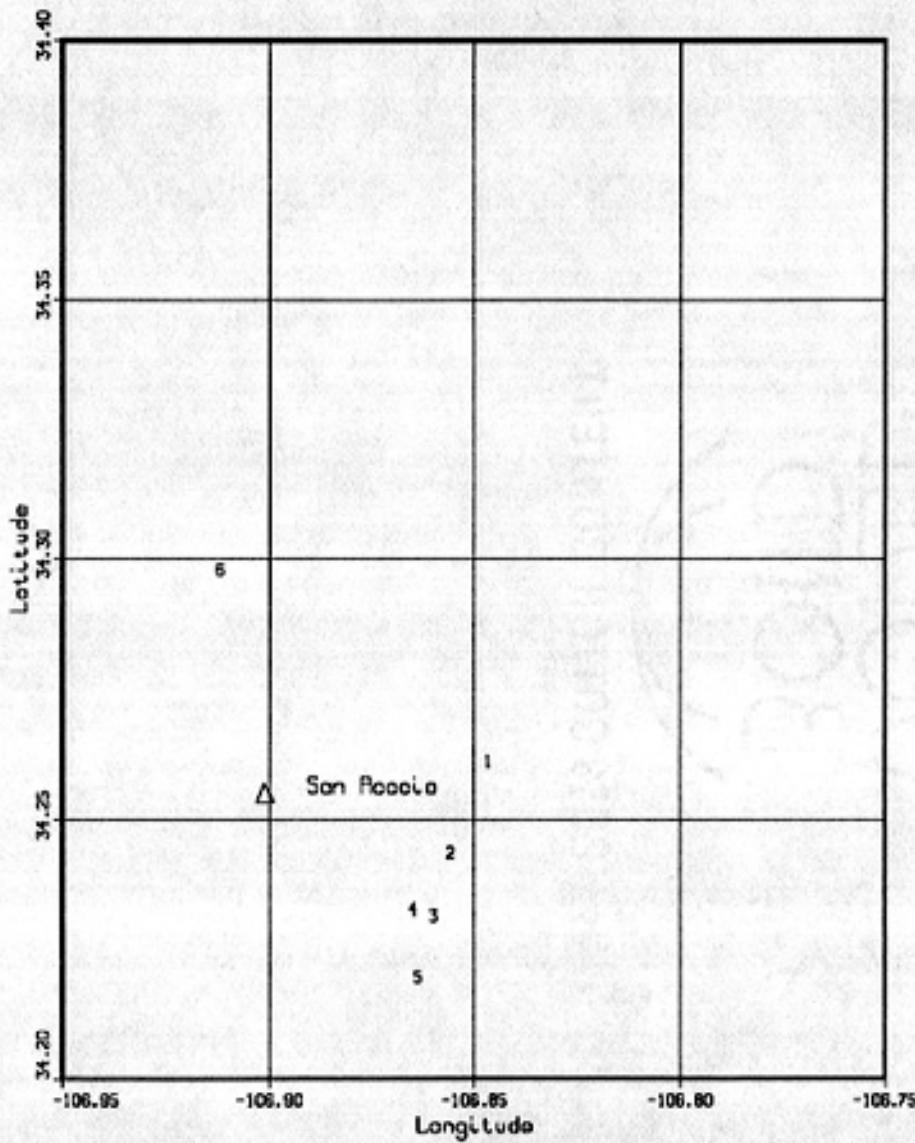
1986 1/3 to 1/12 Swarm
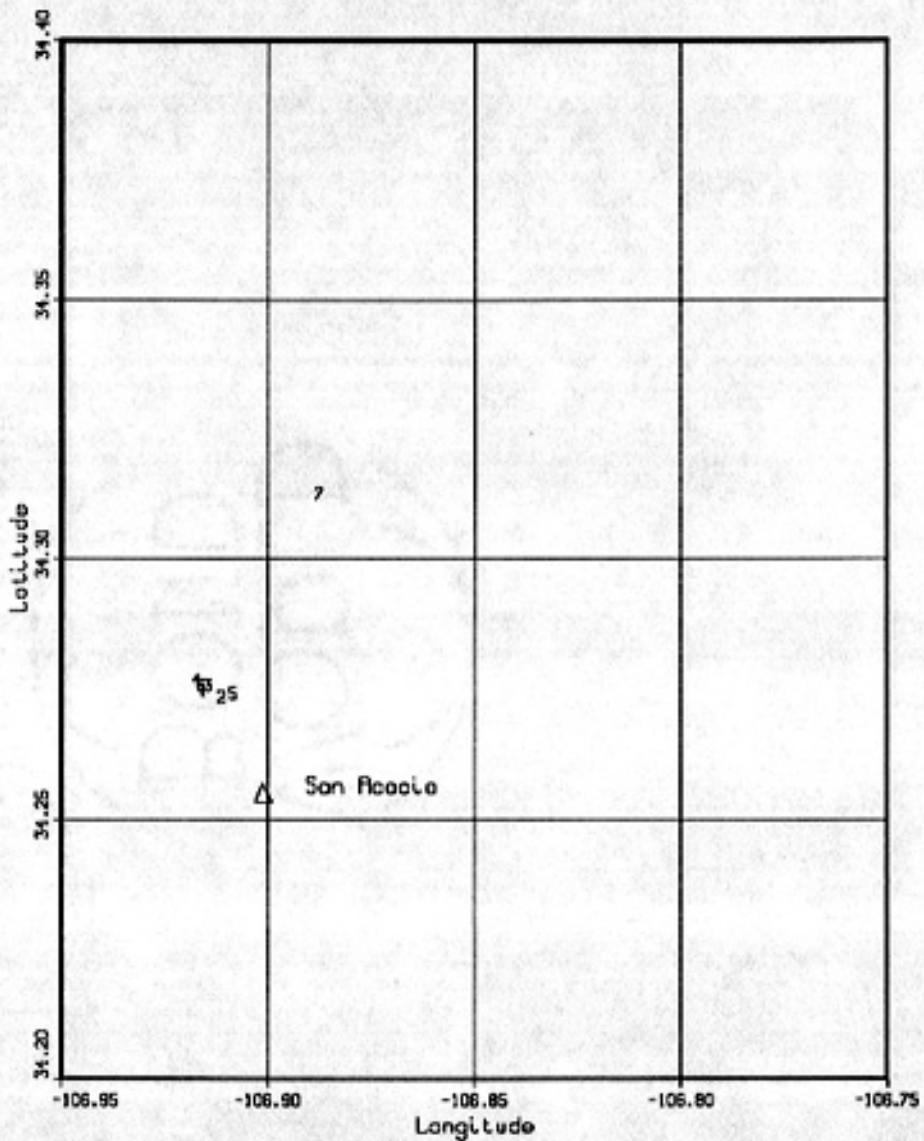
1986 1/27 to 2/2 Swarm
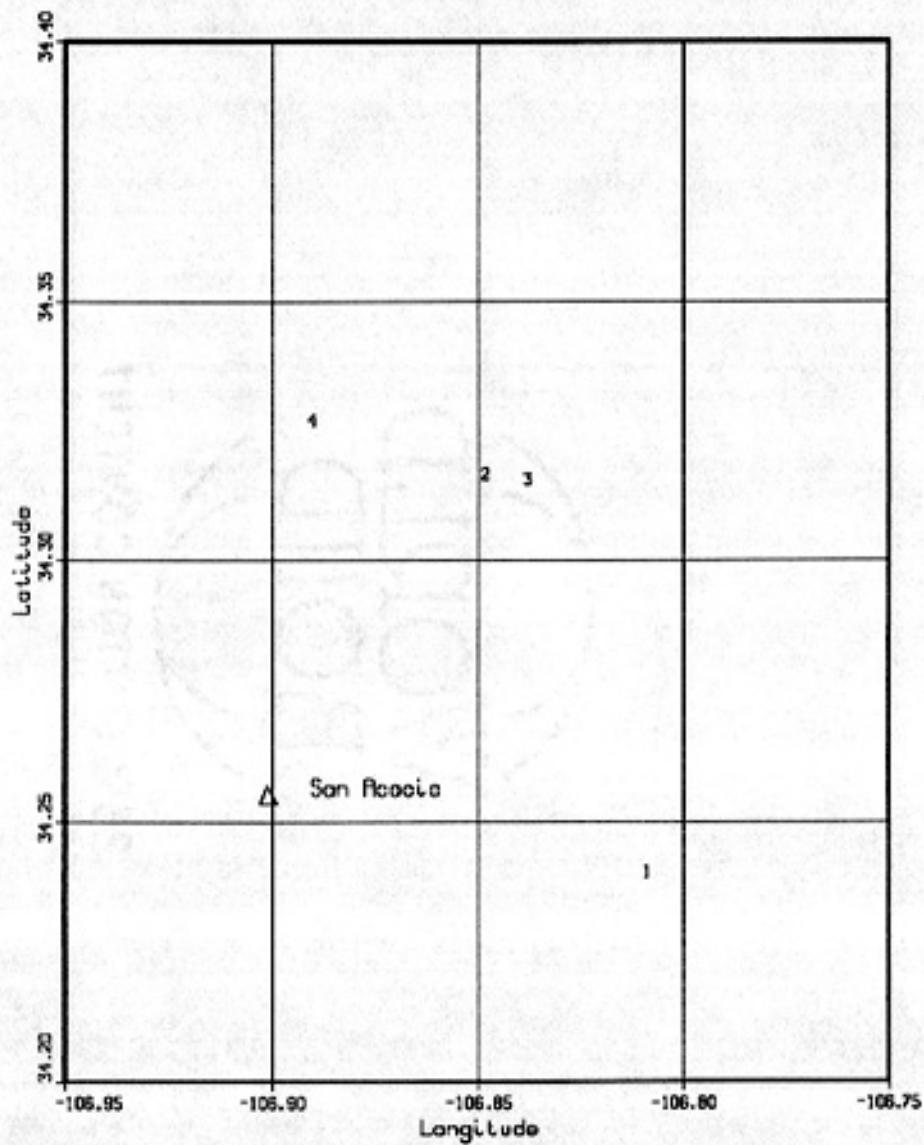
1986 4/9 to 4/13 Swarm
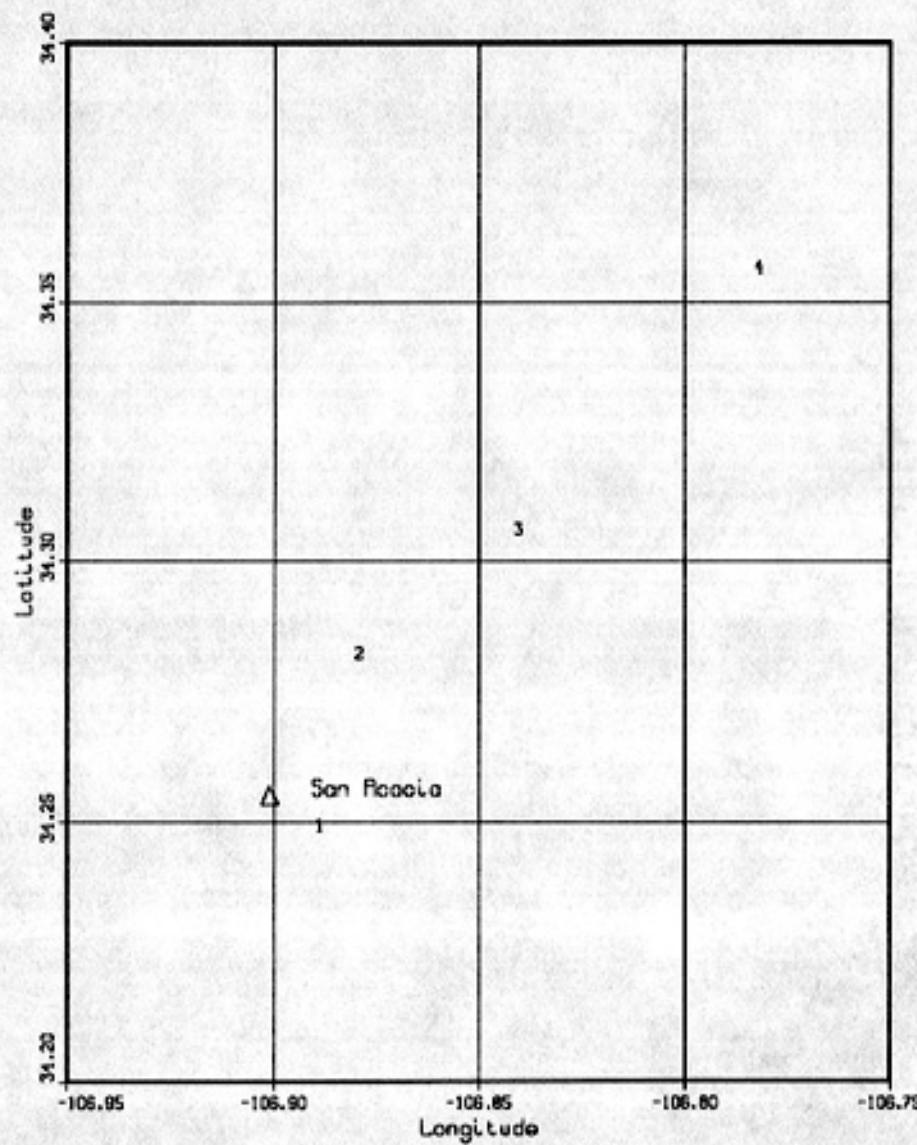
1986 5/21 to 5/23 Swarm
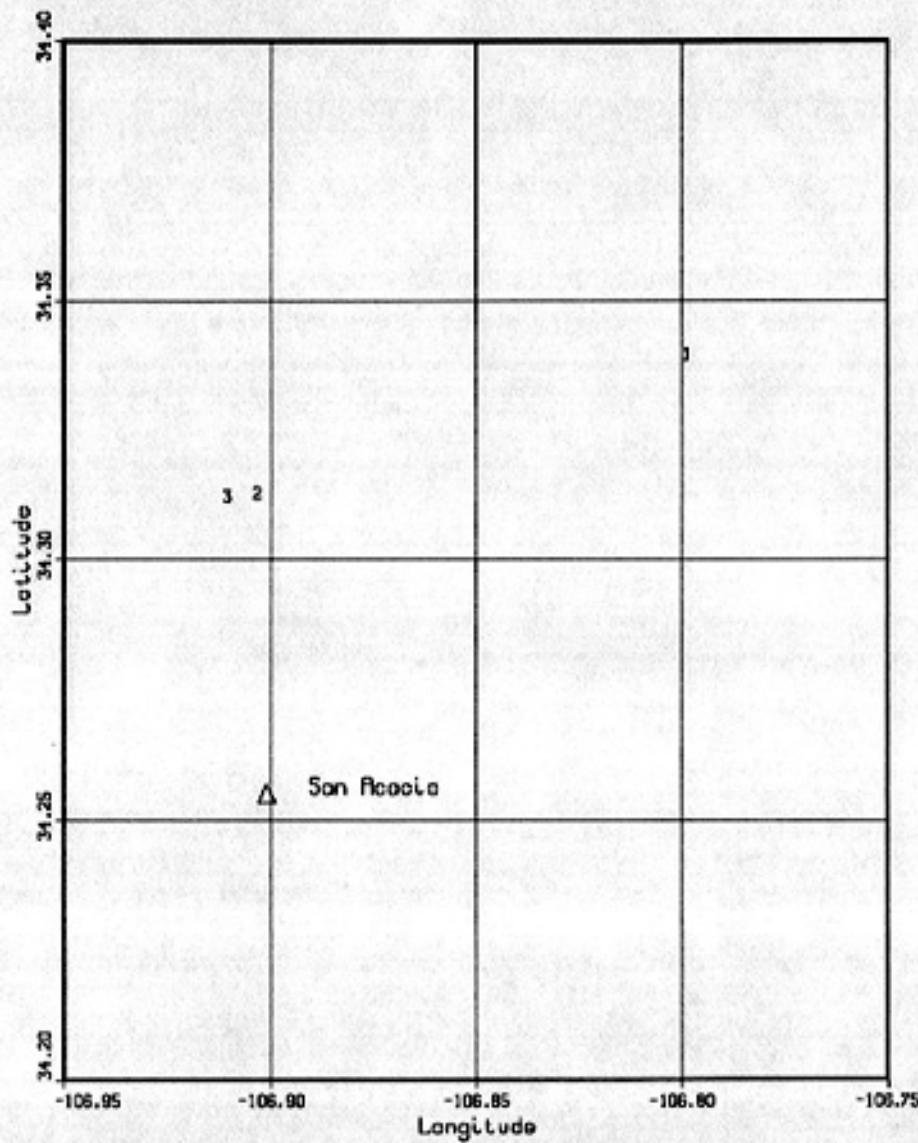
1986 9/21 to 9/26 Swarm
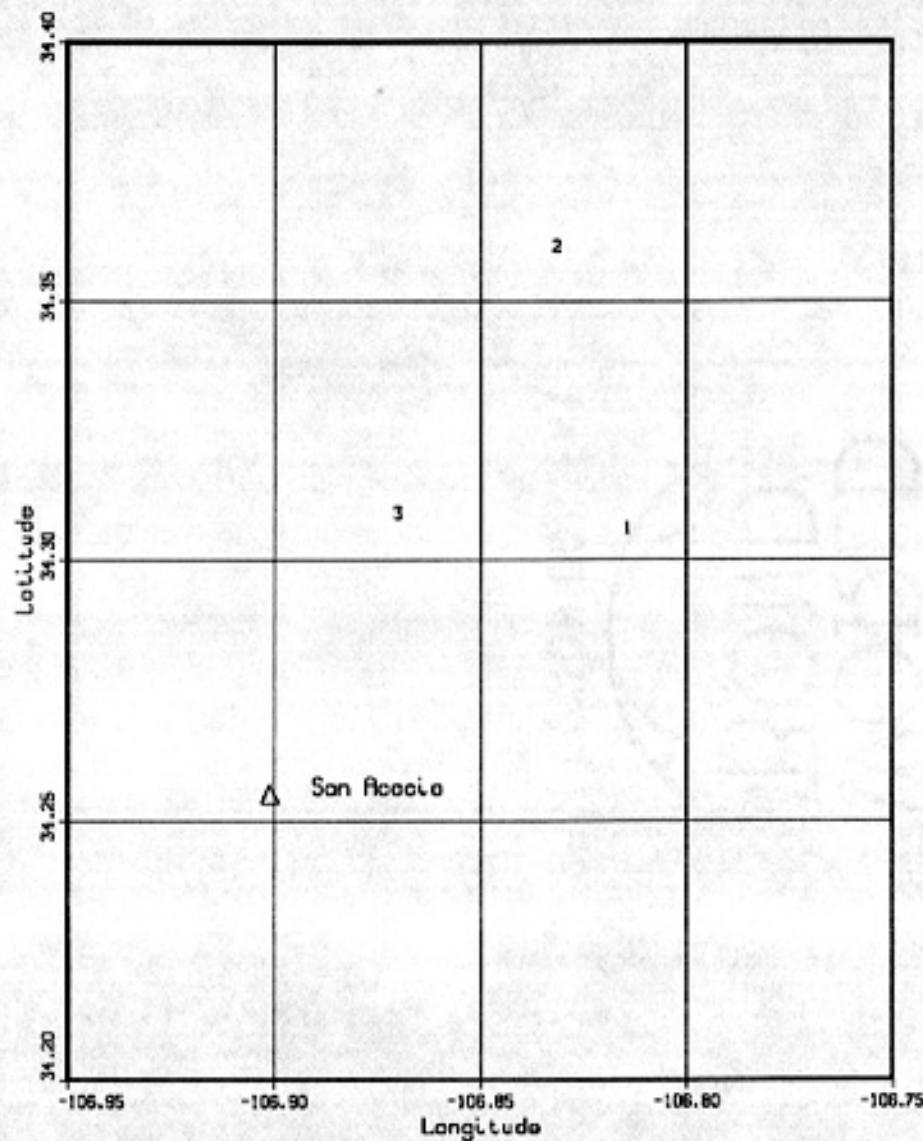
1986 10/7 to 11/1 Swarm
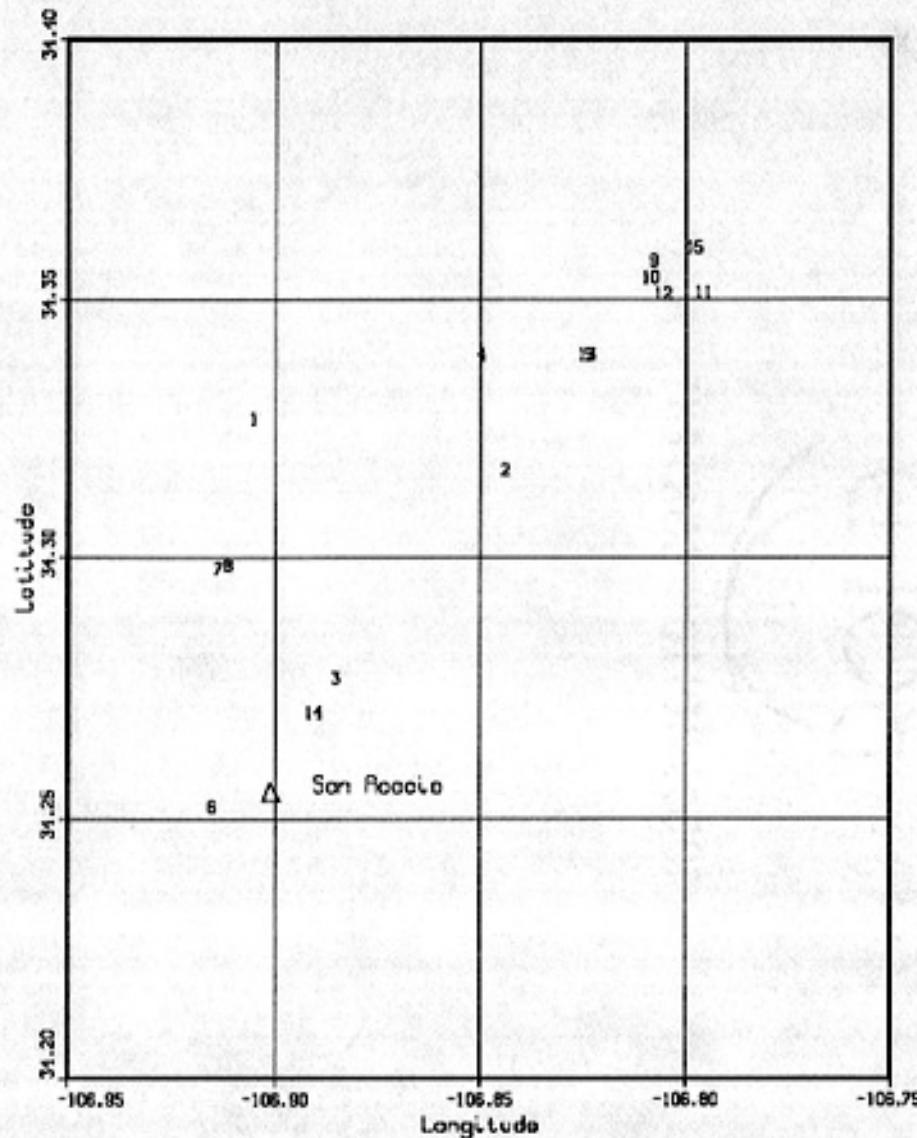
1986   10/7 to 11/1   Swarm
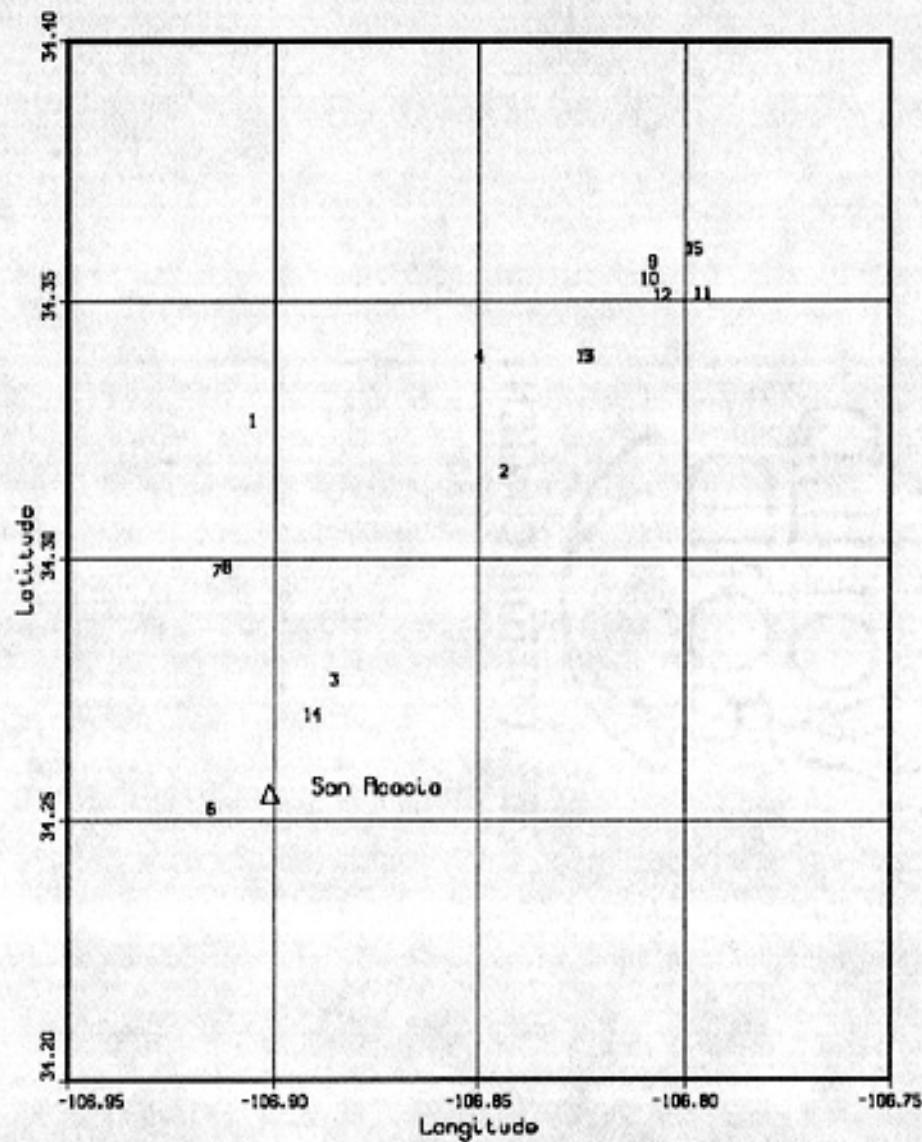
1986   11/25 to 11/30   Swarm
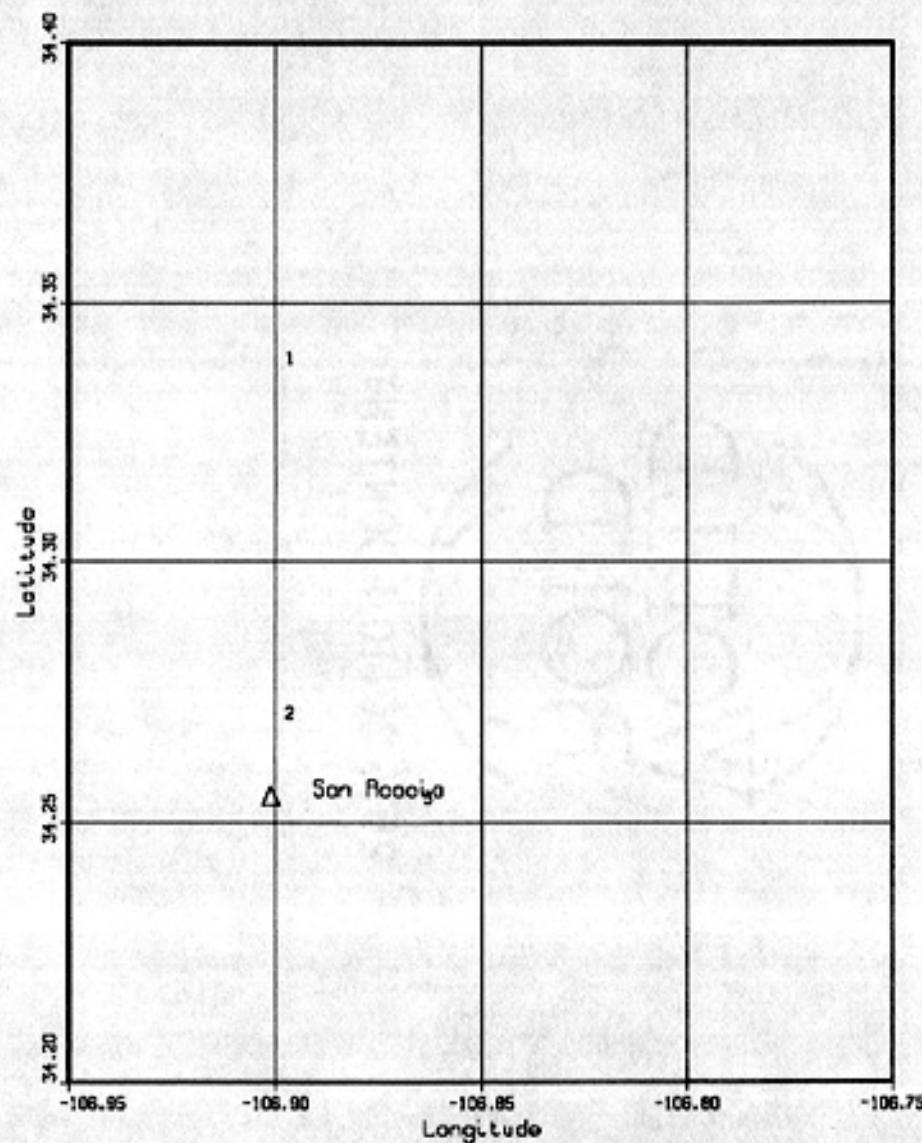
1986 12/20 to 12/30 Swarm
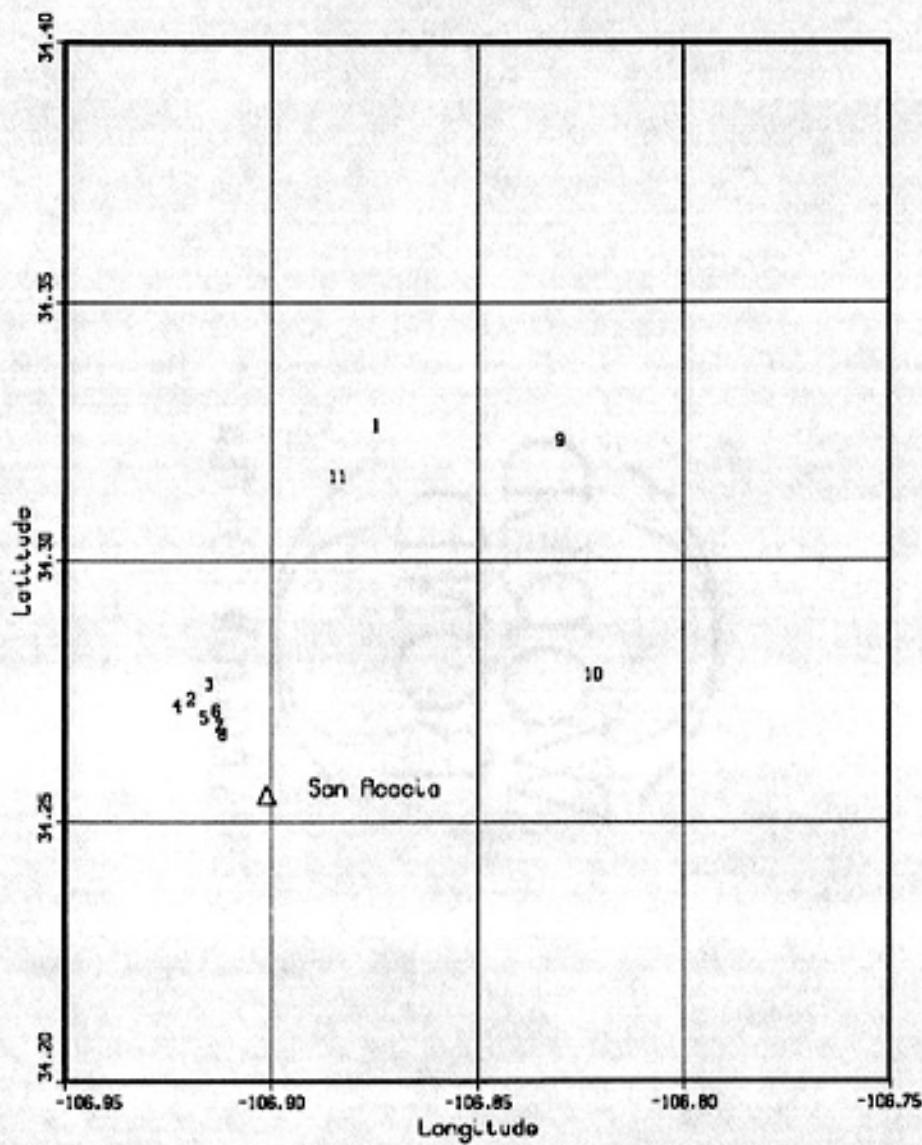
1987 1/8 to 1/31 Swarm
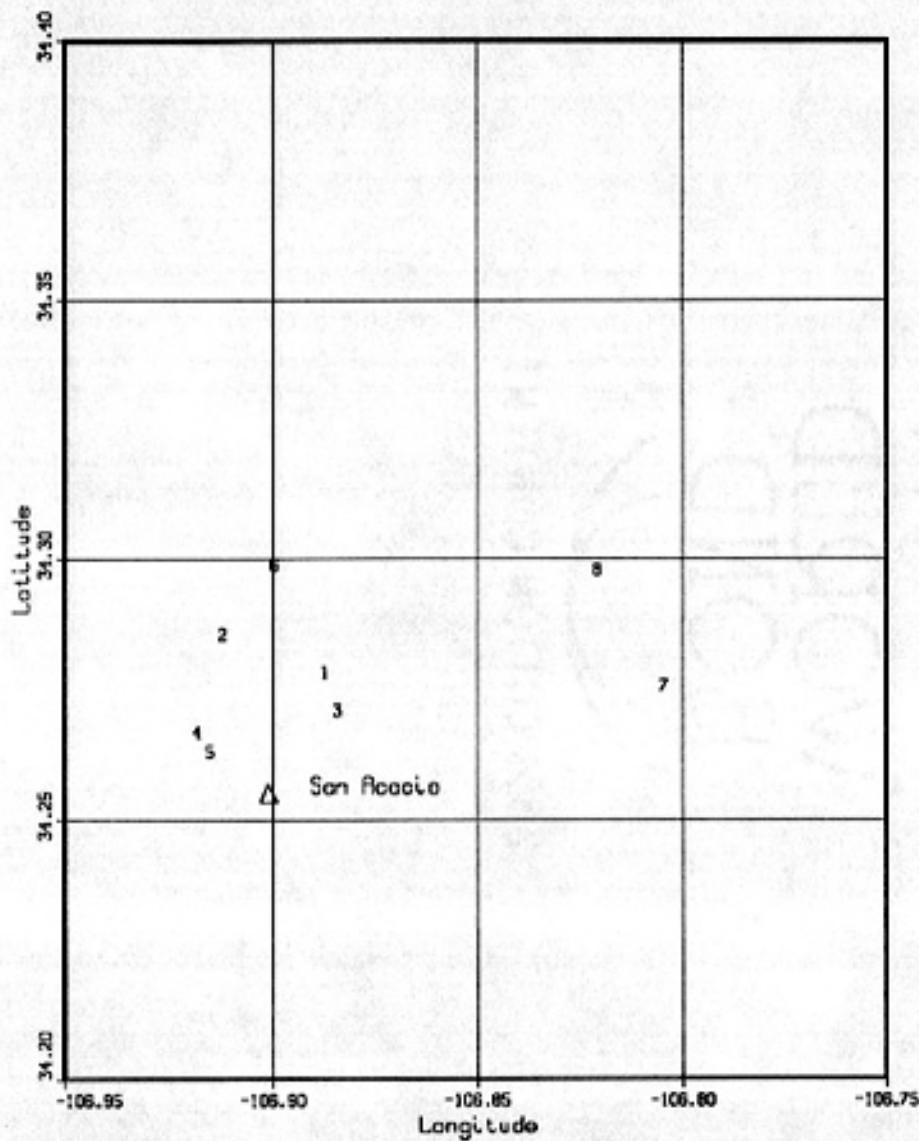
1987 2/7 to 2/17 Swarm
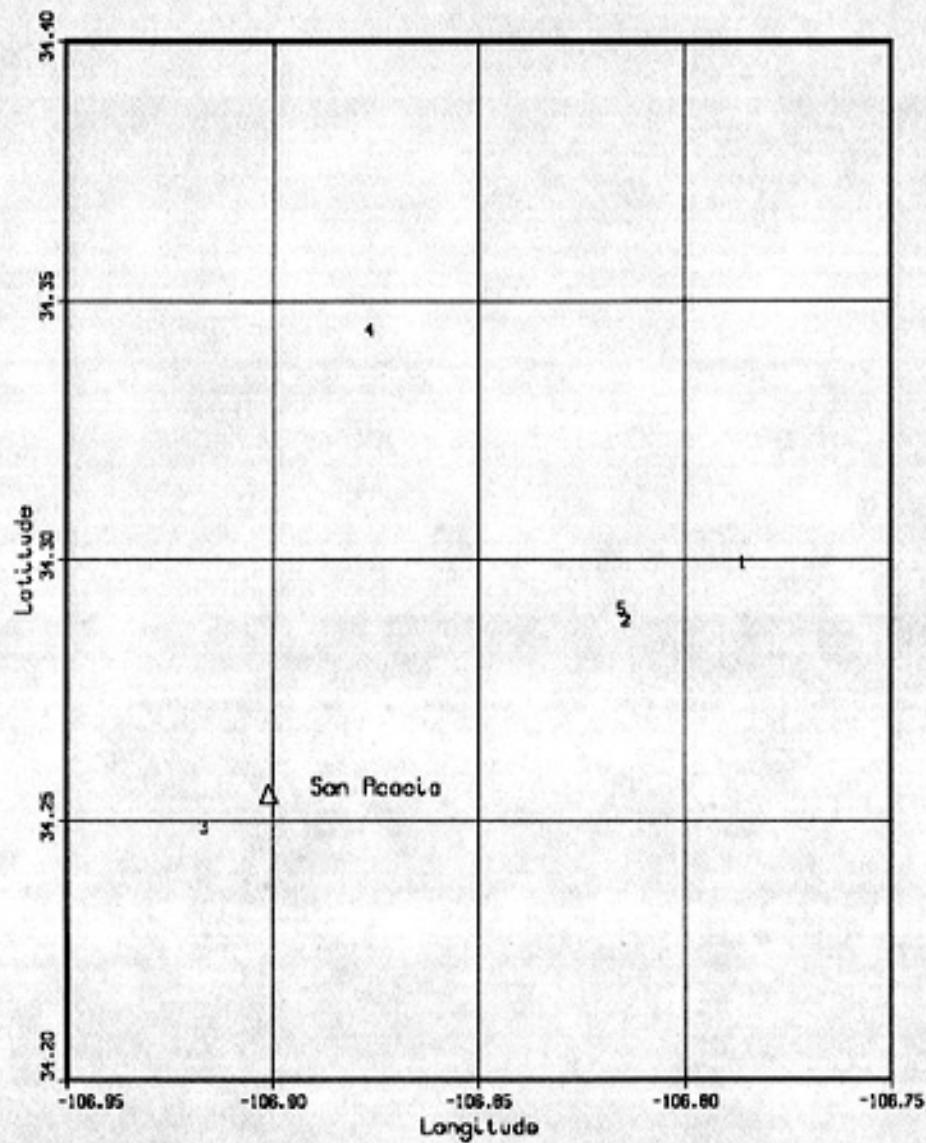
1987 7/20 to 7/28 Swarm
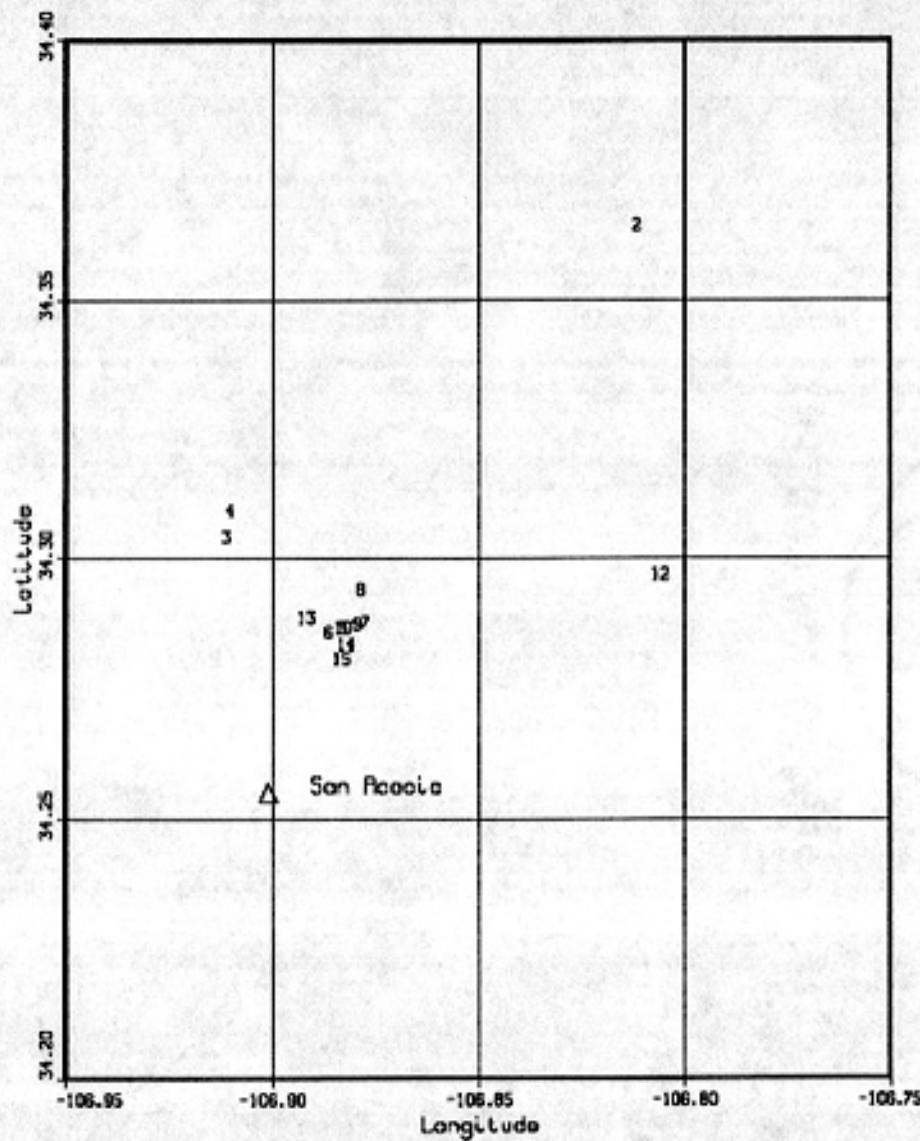
1987 8/16 to 8/18 Swarm
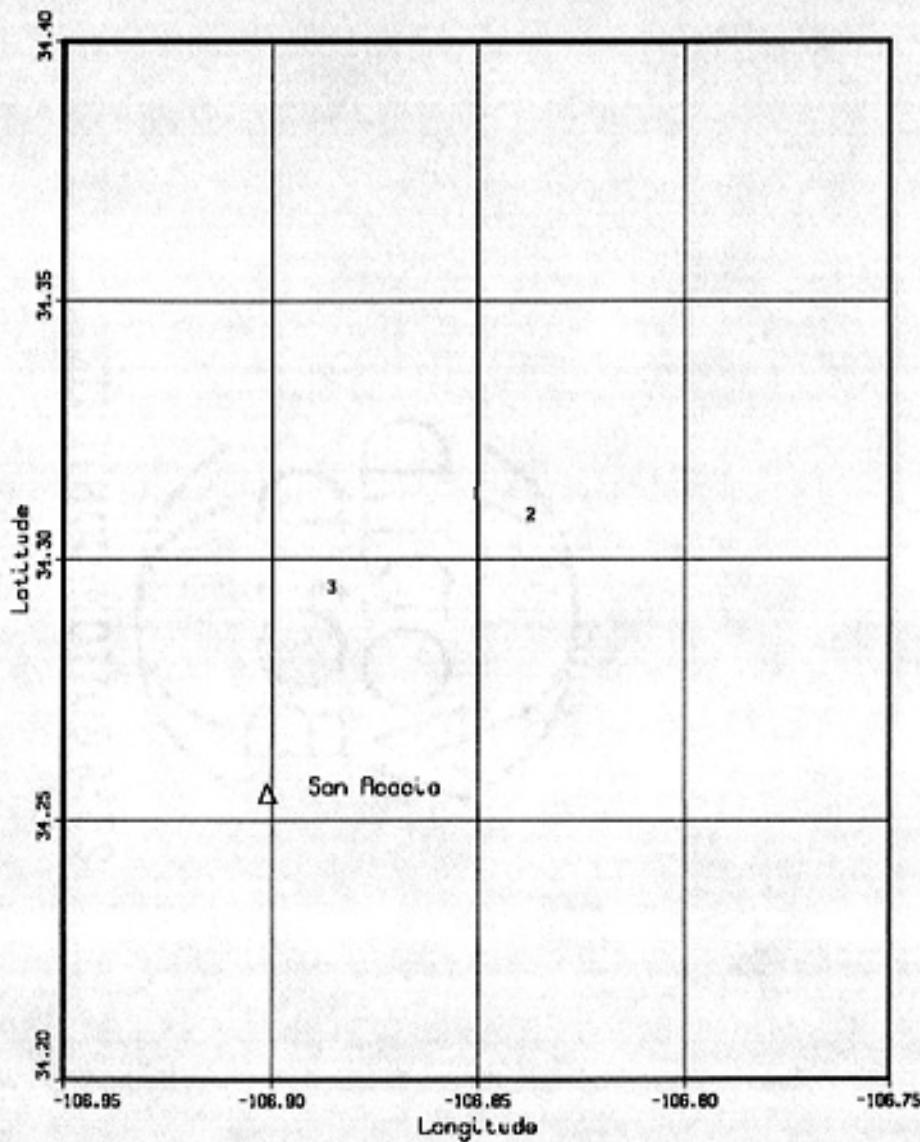
1987 9/6 to 9/7 Swarm
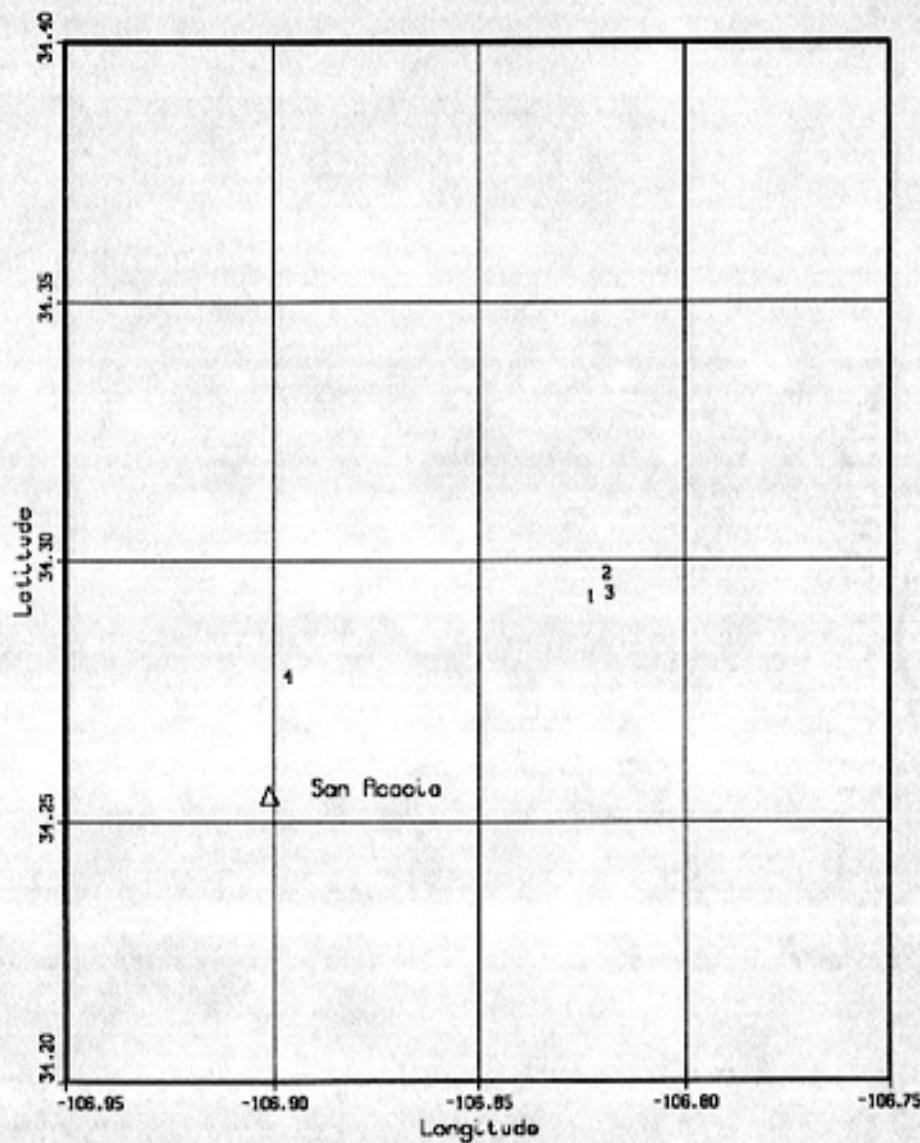
1988 1/12 to 2/10 Swarm
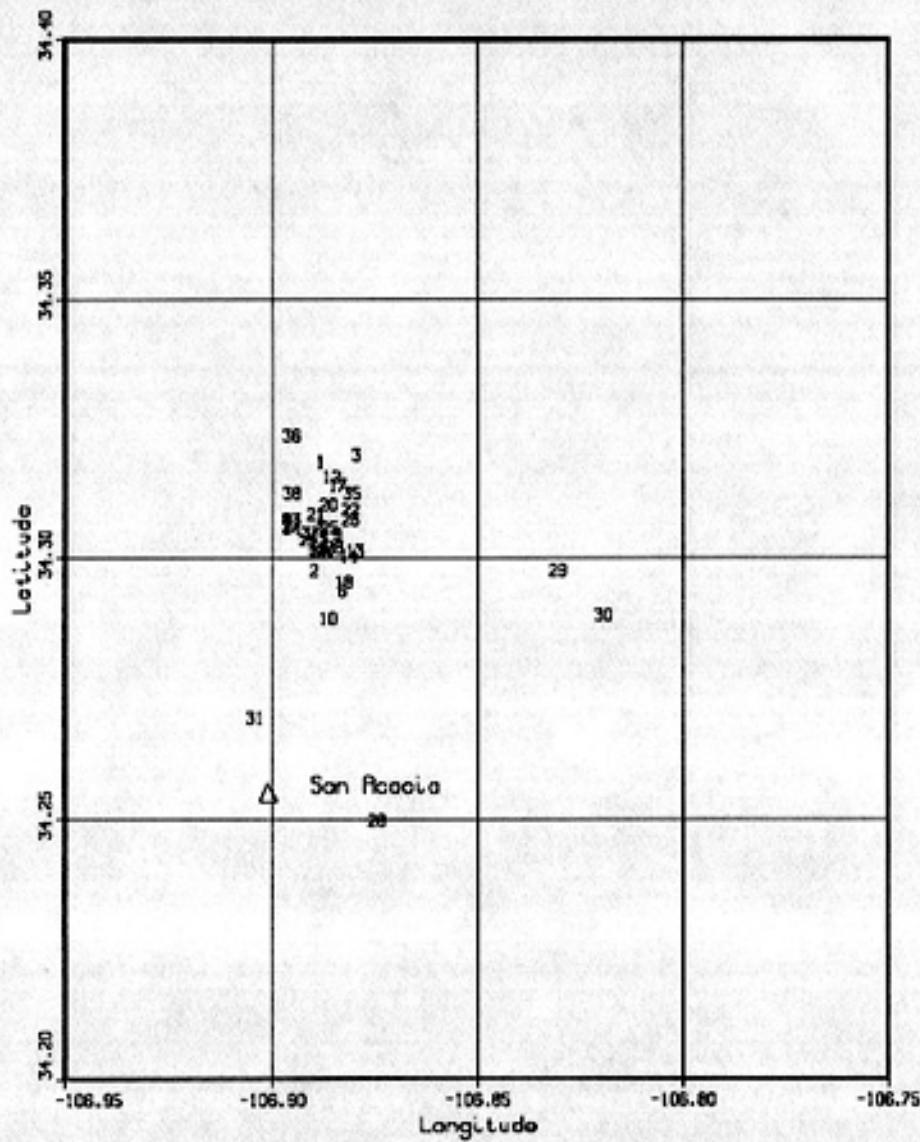
1988 3/2 to 3/13 Swarm
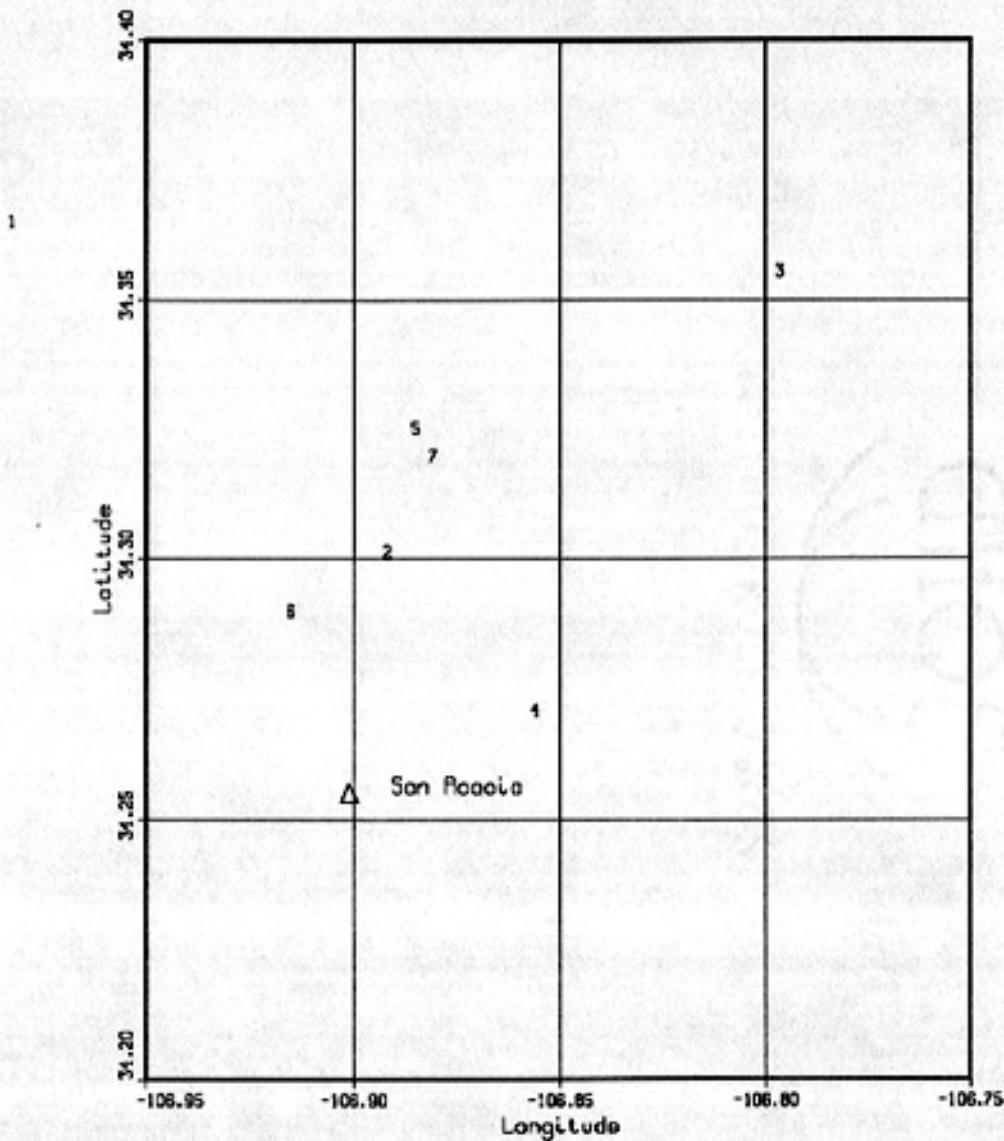
1988 4/2 to 4/10 Swarm
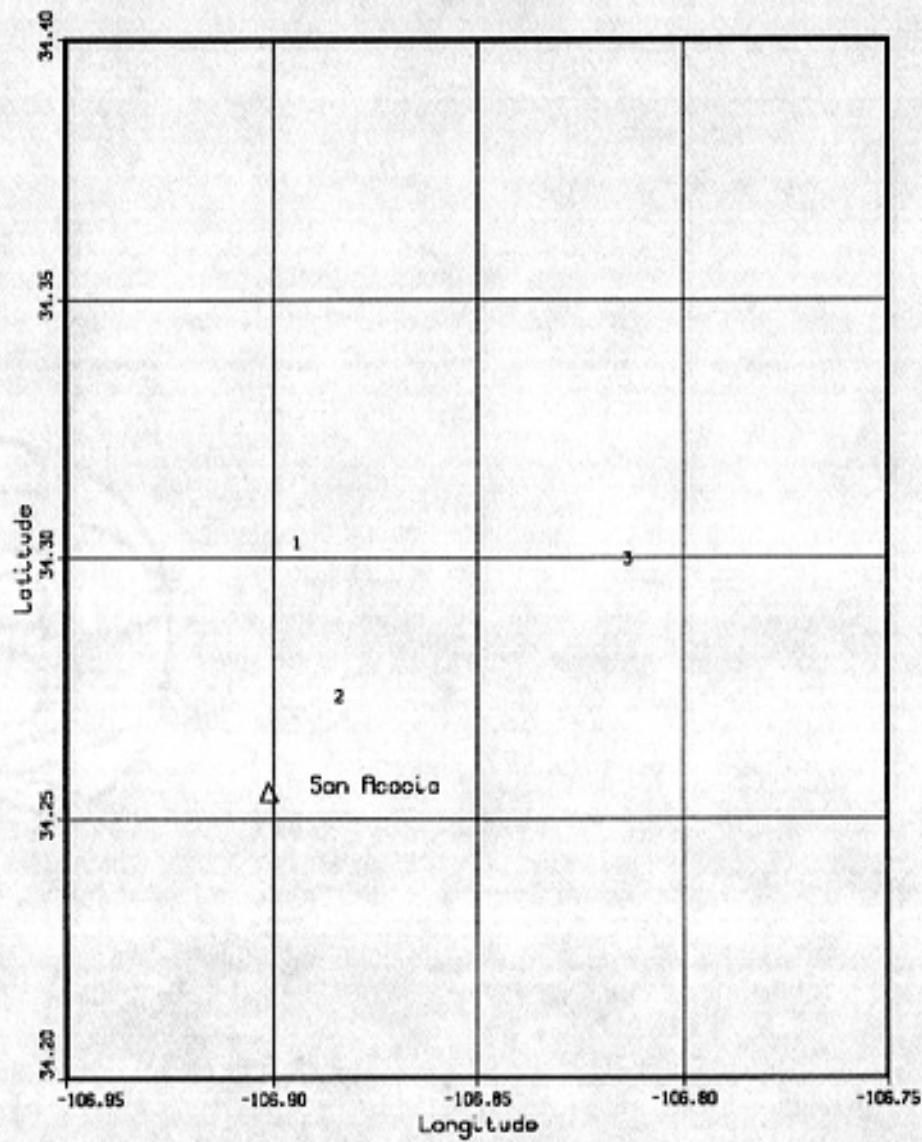
Appendix C

Tables of first motion data with arrival character and quality

Stations in order of azimuth from events

Date Time	First Motions U = Compressive D = Dilational
Latitude Longitude	Arrival i = impulsive e = emergent noi = noisy end = edge of record lap = overlapping traces
Depth Magnitude	Quality of arrival 1 = best 2 = good 3 = fair 4 = poor
	precursor presence and style p = present bg = first swing 1/4 of next f = slower frequency

Event (Date/Time · Lat/Lon · Depth/Mag)	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
82 824 758 36.00 34-17.37 106-53.09 Z = 13.74 Md = 1.13	D Pg 2		U i 2	U 1 P				U e 3						U e 2	D 1 1									
82 9 3 2111 33.54 34-22.57 106-52.88 Z = 2.09 Md = 1.17	D noi 4			D i 1	D i 1			U i 1						D 2	D i 1									
82 918 339 37.57 34-18.08 106-47.99 Z = 13.07 Md = 1.94	D Pg 3		U i 1	D noi 3	D 1 P			U e 2 P		D i 1				D i 1	D i 1							D i 1		
82 918 341 14.63 34-18.14 106-48.92 Z = 7.00 Md = 2.15	D Pg 3		U i l ?	D 3				D e 3 P		D i 2				U i l	D i l							D i l		
8210 7 1241 25.99 34-18.53 106-48.91 Z = 3.73 Md = 2.36	U Pg 3 p?		U i 1	U e 3	D i 1			U Pg? 1 p		D 1 p				D noi 3	U i 2 bg?							D 2 ?		
8211 3 922 27.08 34-17.99 106-46.91 Z = 15.86 Md = 1.13	D Pg 4	U tic 3	U i 1	D i 1				D i 2 f?		U 2 p				U e 2	D? ? 1?							U e 2		
83 225 257 54.31 34-16.75 106-52.99 Z = 13.24 Md = 2.44			U i 1	U i 1	D i 1			D i 1		D i 1				~	U i 1				U i 1			U i l p		

Stations in order of azimuth from events

Date	Time		First Motions U = Compressive D = Dilational
Latitude	Longitude		Arrival i = impulsive e = emergent noi = noisy end = edge of record lap = overlapping traces
Depth	Magnitude		Quality of arrival 1 = best 2 = good 3 = fair 4 = poor
			precursor presence and style p = present bg = first swing 1/4 of next f = slower frequency

Event	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
83 225 849 55.51 34-17.03 106-53.83 Z = 7.00 Md = 1.85			lap	U i 2	D i 1 bg?			D 1		D l f			-		U i 1				U i 1 bg?			U 2 f		
83 226 1115 41.05 34-18.57 106-52.41 Z = 11.57 Md = 3.04			U i 1	U i 1	U i 1			D i 1		D i l f			D noi 2		U i 1				U i 1			U i 1		
83 226 1136 44.35 34-17.74 106-52.41 Z = 1.39 Md = 1.53			U i 1	U i 1	U i 1			D e 4		D e 3			noi		U i 1				U 1			U e 3		
83 226 1553 38.03 34-17.60 106-52.88 Z = 1.40 Md = 1.47			U i 1	U i 1	U i 1			D e 4		U e 4			~		U i 1				U i 1			U e 3		
83 226 1719 43.45 34-18.03 106-53.17 Z = 0.30 Md = 1.06			U i 1	U i 1	U i 1			U e 4		D e 3			noi		U i 1				U 1			U end 4		
83 226 19 0 42.48 34-18.56 106-52.33 Z = 7.00 Md = 1.44			U i 1	U i 1	D 1			U e 4		D e 3			~		U i 1				U i 1			D e 3		
83 228 1349 13.40 34-17.27 106-53.19 Z = 1.32 Md = 1.56			U i 1	U i 1	U i 1			U l f		D e 2			~		D 1 p				U e 2 p			U end 3		

Stations in order of azimuth from events

Date / Time / Latitude Longitude / Depth Magnitude	First Motions U = Compressive D = Dilational
	Arrival 1 = impulsive e = emergent noi = noisy end = edge of record lap = overlapping traces
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Event	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
83 228 2312 42.07 34-17.89 106-52.80 Z = 4.71 Md = 2.29			U i 1	U i 1	U i 1			U i 1 f		U i 2			D tic 3	U i 1					U i 1			U 1 p		
83 3 2 2322 18.61 34-18.26 106-52.48 Z = 20.70 Md = 4.20			noi	U i 1	D i 1 pre			D i 1		D i 1		U i 1		U i 1					U i 1			U tic 2 p		
83 3 3 1119 0.05 34-18.29 106-52.10 Z = 7.00 Md = 1.67			U i 1	U i 1	tic 4			U e 2		U 1		U i 1	noi	U i 1	U i 1				U i 1			D e 2 p?		
83 3 3 16 7 0.04 34-18.08 106-51.78 Z = 7.57 Md = 1.00			U i 1	D i 1	U i 1			noi		U 1		U i 1		U i 2	D i 1				D 2			D e 4		U i 1
83 3 3 1740 0.05 34-18.59 106-52.01 Z = 7.41 Md = 1.92			U i 1	U i 1	D i 1			D e 2		D e 3		U i 1		U i 1	D i 1				U i 1			D e 2 f?		D 1 p?
83 3 3 2235 0.02 34-17.92 106-52.58 Z = 4.51 Md = 1.02			U i 1	U i 1	U i 1			U e 4		D e 3		U i 1		U i 1	U i 1				U 1 p?			D noi 4		D e 2 p
83 3 4 0 0 0.02 34-18.29 106-52.54 Z = 5.35 Md = 1.99	U i 1 bg	U end 2	U i 1	U i 1				U i 1 bg		D e 2 p?		D noi 2 p?		U e 2 p	U i 1 p?				U 1 p			U 1 p		U i 1 bg?

Stations in order of azimuth from events

	First Motions U = Compressive D = Dilational
Date Time	Arrival i = impulsive e = emergent noi = noisy end = edge of record lap = overlapping traces
Latitude Longitude	Quality of arrival 1 = best 2 = good 3 = fair 4 = poor
Depth Magnitude	precursor presence and style p = present bg = first swing 1/4 of next f = slower frequency

Date / Time / Lat / Long / Depth / Mag	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
83 3 4 147 0.00 34-17.93 106-52.33 Z = 4.61 Md = 1.87		U i 1	U i 1	U i 1	U i 1		U 1 p	D e 2		D 2		D e 2 p			U e 2 p	U i 1			U e 2 p			U e 2 f?		U i 1 bg
83 3 4 149 0.01 34-18.14 106-52.52 Z = 6.55 Md = 1.30	D end 1 p?	U i 1	U i 1	U i 1		U i 1	U e 2 f?		D noi 3	U 1 p					U 2 p?	D i 1			U 1 p?			U e 3 f?		U i 1
83 3 4 525 59.99 34-18.08 106-52.67 Z = 6.54 Md = 1.90	U i 1 bg?	U i 1	U i 1	D i 3?		U i 1	D e 2	U e 2 f?		U i 1					U i 1	U i 1			U 2 p			U e 3 f?		U i 1 bg
83 3 4 1819 59.94 34-17.67 106-52.35 Z = 5.32 Md = 1.10	U i 1 p?	U i 1	U i 1	U i 1			U noi 3	U e 4		U e 3		U i 1			U 1	U i 1			U e 2 p?			pen		U 1 p
83 3 6 2213 29.85 34-18.87 106-51.22 Z = 7.00 Md = 1.89		U i 1	U i 1	U 1				D tic 3		U e 3					U i 1	U i 1 bg			U e 2 p			D e 3 p?		D 1 p
83 3 8 6 6 0.05 34-18.29 106-52.79 Z = 5.79 Md = 1.24		U i 1	U i 1	D 1	U e 2 p		D e 3	U e 2							U i 1		U i 1		U 1 p?			D 2 p		U 1 p
83 3 8 619 0.01 34-18.17 106-52.80 Z = 4.48 Md = 2.03		U i 1	U i 1	U i 1	U i 1 p?		U 2	U i 1					D e 3		U i 1		U i 1		U 1 p?			D 2 p		U i 1 bg

Stations in order of azimuth from events

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| Date   Time
Latitude   Longitude
  Depth   Magnitude | First Motions U = Compressive D = Dilational
Arrival i = impulsive e = emergent noi = noisy end = edge of record lap = overlapping traces
Quality of arrival 1 = best 2 = good 3 = fair 4 = poor
precursor presence and style p = present bg = first swing 1/4 of next f = slower frequency |

	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
83 3 8 827 0.13 34-17.37 106-51.80 Z = 4.57 Md = 1.42		U i 1	U i 1	D noi 2	D end 2 p			D 2		D noi 3					U i 1		U i 1	U 1				D noi 3		D 1 p?
83 3 9 9 4 60.00 34-18.10 106-52.74 Z = 5.43 Md = 1.69		U i 1	U i 1	D i 1	U e 1 p			D noi 4		D noi 2					U i 1				U i 1 p?			U i 2 p	U i 1 p	
83 3 9 2325 0.01 34-18.05 106-52.78 Z = 5.16 Md = 1.24		U i 1	tic 2	D i 1	U e 1 p			D e 2		U e 2					U i 1		U i 1	U i 1 p?				U e 2 p?	D i 1	
83 311 1046 13.48 34-17.80 106-51.96 Z = 10.34 Md = 1.09		U i 1	U i 1	D 1				U e 3		U e 4					U i 1		U end 2	end				U e 4	U i 1 p?	
83 312 21 8 16.53 34-17.70 106-52.89 Z = 1.04 Md = 1.36		U i 1	U i 1	D 2 f				D e 3		D e 3			-		U i 1		U i 1	U 1 pf				U e 3		
83 315 927 2.93 34-17.07 106-52.33 Z = 1.00 Md = 2.60		U i 1			U i 1			U 1		U 1 p?			U e 3		U i 1							U e 2 p		
83 316 830 29.28 34-17.80 106-52.13 Z = 1.81 Md = 1.63		U i 1	U i 1		U 1 p			D e 4		U e 3			~		U i 1				U i 1			D e 3		

Stations in order of azimuth from events

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Date / Time / Latitude / Longitude / Depth / Magnitude	First Motions U = Compressive D = Dilational
	Arrival i = impulsive e = emergent noi = noisy end = edge of record lap = overlapping traces
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Event	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
83 317 2235 52.14 34-18.15 106-53.13 Z = 12.77 Md = 2.99			U i 1	U i 1 bg?	D i 1 p			D 1 px		D e 2 px			D e 2	U i 1					D i 1 bg?			D i 1 p?		
83 319 2310 55.17 34-16.32 106-53.12 Z = 7.00 Md = 1.17			U i 1	U i 1	D i 1			U e 3		D 2			~		D i 1				U 1 p			U e 4		
83 323 1 0 32.55 34-16.19 106-52.30 Z = 0.48 Md = 2.03			U i 1	U i 1	D i 1			D 3					~		U i 1				U i 1 p?			U e 4		
83 325 1252 20.76 34-20.30 106-52.76 Z = 12.20 Md = 1.10			U i 1	U i 1	D 1 p			D e 4					~	-	U i 3				U 2 f?			noi		
83 331 1610 8.73 34-18.30 106-52.85 Z = 7.00 Md = 2.17			U i 1	U i 1	U i 1			U e 3 f		D 2 p?			D e 3		D i 1 P				D i 1 P			D 1 P		
83 414 1323 50.51 34-15.37 106-54.32 Z = 11.73 Md = 1.37			U i 1	U i 1	U i 1			U e 3		U i 1			U e 2		U noi 3				U i 1			D noi 4		
83 417 1134 27.69 34-18.59 106-52.14 Z = 7.00 Md = 1.25			U i 1	U i 1	U noi 2			noi		U e 3			D i 1		U i 1				U i 1			U e 3		

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Date / Time / Latitude Longitude / Depth Magnitude	First Motions U = Compressive D = Dilational
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	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
83 417 1742 7.78 34-18.32 106-51.83 Z = 7.00 Md = 1.41		U i 1	U i 1	U i 1				D e 4	U e 3				-		U i 1				U i 1			D e 3		
83 516 533 16.56 34-17.51 106-48.93 Z = 7.00 Md = 1.05		D i 1	U i 1	U i 1				D e 3	D e 3				-						U i 1			U 2		
83 811 2215 38.98 34-18.87 106-52.68 Z = 16.29 Md = 1.06		U i 1	U i 1	U i 1 p				tic	noi	U e 2			~		U i 1				U 1					
84 826 219 54.23 34-18.87 106-48.44 Z = 16.87 Md = 2.49		U i 2	U i 1	D i 2				D i 1	U i 1	D i 1			D 2						D i 1 bg?			D i 1 bg?		
8411 5 845 59.92 34-18.59 106-48.24 Z = 12.82 Md = 2.10		U i 2	lap	U i 1				U i 1		U i 1 f			D i 2 f	D i 1 bg?					U i 1 p?		U i 2	U 1 p		
8411 5 13 0 10.74 34-18.65 106-48.89 Z = 11.38 Md = 1.76		U i 2	lap	U i 1				U i 1		U 1 p			U tic 4 f	D i 1 bg?					U i 1 p		U i 2	D 2 p		
85 425 1611 18.84 34-15.80 106-53.13 Z = 6.02 Md = 1.03		U i 1	U i 1	DU ee 23 2f?				U e 3		lap			~	U i 1					U 2 p?		U i 1	noi		

Stations in order of azimuth from events

Date / Latitude / Depth	Time / Longitude / Magnitude
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Event (Date / Lat-Long / Z-Md)	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
85 816 11 6 48.52 34-15.97 106-50.88 Z = 5.73 Md = 1.32			U i 1	U i 1	DD ii 11			U 2		U 1	U i 1		U i 1	U i 1					U 1 p		D i 2 f?	U e 3		
851031 1633 17.08 34-17.30 106-49.37 Z = 12.60 Md = 1.55			U i 1 bg?	U i 1	DD ii 11 bg?			D 2		DU e 2 f			U i 1 bg?	U i 1					U i 1		tic	D e 4		
861013 1216 27.59 34-18.97 106-50.71 Z = 0.61 Md = 1.35			U i 1	U i 1	UU ii 11 f?p			D 1		D i 1 p	D i 1		noi	D 1 p					U i 1 p		U i 1	U 1 p		
861025 0 5 37.78 34-17.85 106-54.76 Z = 2.99 Md = 1.09			U i 1	U i 1	U i 1			D end 3		D i 1	D i 1 p?		D i 1 f	D i 1 p?					U i 1		D i 1			
861031 1516 29.82 34-21.39 106-48.54 Z = 11.18 Md = 1.72			U i 1	U i 1	DD ii 11 PP			D 2 p		D e 2 f?	nr		U 1 p?						U i 1		U i 1	D tic 3 p?		
861031 1521 35.82 34-21.20 106-48.67 Z = 3.63 Md = 1.65			U i 1	U pre 3	DD pre 31			D e 4		U e 2 f?	D pre 2		U 2	U pre 2							noi	D 1 p		
861221 4 9 19.51 34-16.51 106-54.97 Z = 4.33 Md = 1.40			U i 1	U i 1	U i 1 p			U e 3		U 1 p	U i 1		U i 1	U i 1					U i 1 f		U i 2	U e 2 f		

Stations in order of azimuth from events

Date Time Latitude Longitude Depth Magnitude	First Motions U = Compressive D = Dilational Arrival i = impulsive e = emergent noi = noisy end = edge of record lap = overlapping traces Quality of arrival 1 = best 2 = good 3 = fair 4 = poor precursor presence and style p = present bg = first swing 1/4 of next f = slower frequency

Event	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
861222 624 18.94 34-16.14 106-55.06 Z = 0.86 Md = 1.80			U noi 4	U i 2	U i l p			U end 3	U i 1	U i 1			U i 1	nr						nr	U i 1	D i 1		
861222 1629 43.73 34-16.22 106-54.87 Z = 0.89 Md = 1.21			nr nr	U i 1	U 2 p			D e 3		noi	U i 1		U 1	?						nr	U i 1	U e 2 p		
87 7 9 2224 11.56 34-17.11 106-53.49 Z = 0.21 Md = 1.28			nr nr	U i 1	U 2			UU ee 22	D 2	U i 1	U e 3	U i 1							U i l p		U i 2	U i l f		
87 725 1 6 34.80 34-17.14 106-53.06 Z = 0.94 Md = 1.96				spk	U i 1	−		DD 11 PP		U i l p	U? i? 1?		U 1						U i 1		U i 1	U 1 px		
87 725 932 43.17 34-17.58 106-52.81 Z = 2.55 Md = 1.10			U lap 4	U i 1 bg?		−		UU e 12		U e 1	U i 1		D 3						U i 1 f		U i 1	D 2 p		
87 726 1312 33.23 34-17.26 106-53.65 Z = 0.42 Md = 1.06			U i 1	U i 1	−			U e 2 f		−	U i 1		~						U i 1 pf		noi 3	U 2 pf		
87 810 2145 50.93 34-17.36 106-53.10 Z = 1.16 Md = 1.26			U i 1	U i 1 bg?	−			DD ee 22		noi	U i 1		D 1						U i 1 f		U 2	U e 2 pf		

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	ALQ	BB2	LPM	BAR	CAR	BG2	SAD	SMC	SNM	WTX	LEM	ALA	SB	MAG	BMT	RSD	RS1	RS2	LAZ	WNM	LJY	MLM	LJ2	LJ1
87 818 2359 23.72 34-17.63 106-53.19 Z = 3.65 Md = 1.32			U i 1	U i 1 bg?	D e 3			UU ee 32 ff		D e 3	U i 1		−						U i 1 pf		D i 2	U e 3 p?		
88 114 23 3 30.80 34-19.13 106-52.84 Z = 4.35 Md = 1.89			nr	U l 1 p?	D i 2			UU 11 p		U i 1	U i 1		U i 1	nr					nr		D i 1	U 2		
88 5 8 1159 45.86 34-18.39 106-48.43 Z = 10.81 Md = 1.03			U i 1	U i 1	nr			U e 2		pen		noi	U i 1						U i 1		U i 1	D e 2		

Appendix D

Tables of hypocenters

All hypocenters for San Acacia area 06/82 to 06/88

1982 (second half) hypocenters

1983 hypocenters

1984 hypocenters

1985 hypocenters

1986 hypocenters

1987 hypocenters

1988 (first half) hypocenters

Precise (HYPO71, ERH < 0.5, and ERZ < 1.0) hypocenters

HYPO71 A quality hypocenters

HYPO71 B or better quality hypocenters

Anomalous Fault Plane Solution hypocenters (Jarpe, 1984)

Hypocenters for events with Magnitudes > 1.0

All hypocenters for San Acacia area 06/82 to 06/88

All Hypocenters for San Acacia area 06/82 to 06/88

DATE	TIME	LATITUDE	LONGITUDE	DEPTH KM.	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY
820604	1021 20.81	34-14.06	106-54.43	10.92	00.12	05	18	154	0.05	000.9	002.7	c b d
820728	1244 09.09	34-17.93	106-48.62	07.00	00.24	07	16	118	0.24	001.4	006.8	c c c
820816	1225 06.24	34-14.44	106-50.70	31.32	-0.32	07	21	153	1.06	008.0	015.0	d d c
820824	0758 36.00	34-17.37	106-53.09	13.74	01.13	06	23	121	0.02	000.2	000.9	b a b
820825	0427 33.53	34-18.87	106-48.51	02.87	-0.34	06	16	187	0.13	001.2	010.2	d c d
820826	0655 30.38	34-18.87	106-47.35	07.00	00.10	08	14	119	0.81	007.6	028.2	d d c
820826	1457 18.07	34-18.87	106-49.70	13.69	00.26	08	18	230	1.05	011.1	023.0	d d d
820903	2111 33.54	34-22.57	106-52.88	02.09	01.17	07	34	246	0.08	000.5	007.8	d c d
820905	2350 54.58	34-17.31	106-49.35	09.90	-1.25	06	24	224	0.06	000.9	002.3	c b d
820911	1352 14.65	34-14.90	106-50.90	00.37	-0.67	05	21	268	0.72	012.5	*****	d d d
820918	0339 37.57	34-18.08	106-47.99	13.07	01.94	11	15	065	0.24	001.4	004.6	b b b
820918	0341 14.63	34-18.14	106-48.92	07.00	02.15	10	17	066	0.21	001.2	006.9	c c c
820923	1217 21.98	34-19.44	106-46.97	17.26	-0.51	06	14	192	0.12	001.9	003.0	c b d
820927	1459 56.85	34-18.28	106-48.70	07.00	00.58	13	16	066	0.27	001.0	006.0	c c c
821007	1241 25.99	34-18.53	106-48.91	03.73	02.36	12	17	067	0.20	001.0	008.9	c c c
821007	1616 40.08	34-18.47	106-49.19	07.00	00.29	12	17	067	0.29	001.2	007.6	c c c
821015	1929 36.53	34-17.00	106-48.92	04.80	-0.35	06	17	170	0.07	000.6	005.4	c c c
821017	0601 10.98	34-17.45	106-48.15	11.35	-1.18	06	16	173	0.06	000.4	001.0	b a c
821017	1526 19.06	34-17.96	106-48.46	10.83	-0.83	07	16	178	0.04	000.3	000.9	b a c
821026	0104 33.69	34-17.67	106-48.83	07.00	00.65	15	17	065	0.10	001.0	004.8	c b c
821026	0118 20.18	34-16.81	106-48.92	06.94	-0.66	07	17	169	0.02	000.1	000.7	b a c
821031	0825 28.06	34-17.27	106-51.36	07.00	-0.33	07	21	107	0.49	003.9	018.1	c c c
821103	0922 27.08	34-17.99	106-46.91	15.86	01.13	14	14	063	0.26	001.1	002.9	b b a
821104	2038 06.54	34-18.87	106-52.78	00.16	-0.19	06	23	289	1.47	021.5	*****	d d d
821106	0229 29.50	34-22.30	106-54.06	02.83	00.98	18	25	083	0.32	000.9	014.5	c c c
821106	1651 11.07	34-21.86	106-54.19	13.60	00.77	16	25	127	0.26	000.9	003.0	b b b
821108	0910 00.51	34-17.93	106-49.21	02.60	-0.10	09	17	119	0.18	001.0	011.4	c c c
821110	1621 26.57	34-17.06	106-48.47	14.88	-0.72	05	23	225	0.03	000.6	001.4	c a d
821117	2056 38.18	34-18.87	106-47.03	07.00	-0.25	07	14	186	0.23	002.8	008.8	d c d
821119	1418 15.18	34-16.50	106-49.80	01.63	00.57	06	19	167	0.28	001.3	023.5	c c c
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821130	0458 49.27	34-16.53	106-42.35	16.94	-0.68	06	08	234	0.04	002.0	000.9	c b d
821205	0312 15.11	34-15.78	106-49.59	07.00	-0.49	07	19	125	0.38	002.6	013.0	c c c
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<u>1982 (second half) hypocenters</u>

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870714 1445 11.93 34-16.80 106-53.12 00.79 -0.41 13 06 090 0.08000.2003.9 b b b
870720 0338 36.00 34-21.81 106-48.79 09.40 -0.46 09 08 191 0.17001.0002.9 c b d
870722 2133 17.34 34-18.20 106-54.74 00.77 -0.06 11 04 097 0.08000.3003.4 b b b
870724 0532 01.98 34-18.50 106-54.68 00.78 -0.14 10 03 096 0.06000.2002.3 b b b
870725 0106 34.80 34-17.14 106-53.06 00.94 01.96 09 06 093 0.07000.4004.3 b b b
870725 0207 58.80 34-17.10 106-53.26 00.20 00.40 09 06 090 0.08000.3011.8 c c b
870725 0252 12.31 34-17.21 106-52.74 01.11 00.63 12 06 098 0.07000.2002.6 b b b
870725 0932 43.17 34-17.58 106-52.81 02.55 01.10 07 05 101 0.08000.6002.6 b b b
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870726 0113 40.83 34-17.75 106-48.51 00.65 00.42 09 16 112 0.05000.2005.7 c c c
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870726 1341 48.96 34-16.95 106-53.08 00.62 -0.26 09 06 091 0.08000.4007.2 c c b
870728 1216 57.33 34-16.79 106-53.14 01.04 00.46 07 06 090 0.07000.4005.0 b b b
870810 2145 50.93 34-17.36 106-53.10 01.16 01.26 08 05 094 0.09000.5004.2 b b b
870816 0359 29.86 34-18.72 106-51.09 04.16 -0.31 06 05 146 0.07000.6002.1 c b c
870817 1515 10.67 34-18.46 106-50.32 03.69 -0.19 07 06 147 0.08000.6002.4 c b c
870818 2359 23.72 34-17.63 106-53.19 03.65 01.32 13 05 095 0.12000.5001.8 b a b
870825 0202 41.61 34-16.74 106-53.45 00.06 -0.73 08 15 140 0.25001.3355.5 c c c
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870906 0525 32.96 34-17.80 106-49.22 10.30 -0.65 09 08 142 0.13000.7002.0 c b c
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870917 1448 34.13 34-21.90 106-47.93 12.43 -0.24 11 09 193 0.18001.1002.1 c b d
871017 1211 30.35 34-16.42 106-52.58 03.39 -0.01 08 23 139 0.10000.6007.1 c c c
871103 1907 25.64 34-18.47 106-52.11 07.00 -0.24 12 04 127 0.24001.0002.3 b b b
871105 1053 17.99 34-18.49 106-52.06 07.00 -0.47 11 04 128 0.21001.1002.2 b b b
871202 0418 41.92 34-19.62 106-48.45 09.13 00.40 13 08 125 0.09000.4000.9 b a b
871202 0611 30.11 34-19.20 106-48.07 00.14 -0.11 10 15 167 0.12000.6148.9 c c c
871219 0830 38.58 34-20.06 106-52.42 02.98 00.24 14 02 169 0.10000.4000.6 b a c
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880112 0228 50.10 34-19.05 106-53.38 06.31 00.59 13 02 144 0.09000.6000.8 b a c
880113 1851 53.67 34-17.79 106-53.47 00.84 00.22 13 04 091 0.11000.4003.7 b b b
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880115 0337 54.29 34-18.35 106-53.37 00.93 -0.40 09 17 153 0.11000.6019.9 c c c
880115 1640 35.72 34-18.05 106-53.33 02.33 00.43 15 04 096 0.13000.4001.5 b a b
880115 2053 50.58 34-17.56 106-53.06 01.00 00.13 12 05 138 0.14000.4003.4 c b c
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880119 0159 18.92 34-18.19 106-53.44 00.65 00.04 17 04 095 0.10000.2003.2 b b b
880120 0732 10.38 34-18.88 106-53.29 06.00 -0.23 10 03 145 0.15000.9001.2 b a c
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880120 1031 10.11 34-17.97 106-53.02 01.11 -0.14 07 04 142 0.12000.7004.9 c b c
880120 1903 49.57 34-18.18 106-53.46 03.08 00.05 16 04 094 0.09000.3000.8 b a b
880121 0544 33.64 34-18.01 106-53.50 00.35 -0.29 15 04 092 0.08000.3004.7 b b b
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880126 1507 31.69 34-18.07 106-53.23 01.11 -0.39 13 04 098 0.09000.4002.9 b b b
880128 0314 08.47 34-18.15 106-53.62 02.49 -0.46 10 04 119 0.15000.7001.9 b a b
880128 0736 32.22 34-18.29 106-53.31 01.88 00.86 19 04 099 0.14000.5001.7 b a b
880128 0756 22.69 34-18.38 106-53.00 03.14 00.47 19 04 107 0.14000.5001.2 b a b
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880202 1607 58.10 34-14.91 106-52.61 03.75 00.12 17 10 082 0.15000.4002.1 b b b
880204 0914 32.73 34-17.79 106-49.97 07.37 00.36 19 07 111 0.15000.5001.4 b a b
880204 0924 14.48 34-17.28 106-49.30 04.20 00.21 21 09 108 0.13000.4001.5 b a b
880207 2246 09.83 34-16.09 106-54.38 02.00 -0.75 11 08 096 0.12000.5002.9 b b b
880210 1152 34.10 34-18.05 106-53.49 04.01 -0.57 10 04 120 0.10000.5001.0 b a b
880215 1630 03.92 34-18.39 106-53.85 04.25 -0.73 10 03 086 0.07000.4000.6 a a a
880216 0736 11.42 34-18.30 106-53.85 04.72 -0.48 14 04 085 0.11000.4000.8 a a a
880218 0128 28.35 34-18.70 106-52.99 04.22 -0.21 13 03 113 0.07000.3000.7 b a b
880221 1014 13.75 34-19.36 106-53.85 07.00 -0.11 18 02 087 0.14000.5000.7 a a a
880221 1704 28.95 34-18.24 106-53.58 00.56 00.02 14 04 092 0.13000.5005.4 c c b
880222 1402 33.87 34-18.70 106-53.85 03.51 -0.69 12 03 100 0.09000.4000.9 b a b
880302 0810 52.88 34-21.85 106-59.01 07.50 00.08 12 09 174 0.16001.0001.5 c b c
880304 1059 06.09 34-18.03 106-53.57 00.56 -0.49 14 04 106 0.17001.2010.6 c c b
880305 0458 47.67 34-21.27 106-47.85 09.95 -0.55 10 09 188 0.14001.0001.3 c b d
880305 1825 47.33 34-16.19 106-51.44 04.51 -0.56 11 08 109 0.10000.5002.3 b b b
880306 0715 58.56 34-19.46 106-53.17 06.10 -0.76 09 02 127 0.14001.2001.1 b b b
880312 1826 11.32 34-17.34 106-54.97 04.42 -0.63 07 06 180 0.07001.3001.8 c b c
880313 0102 46.96 34-19.13 106-52.92 07.00 00.29 17 02 115 0.15000.5000.8 b a b
880402 0029 50.67 34-18.12 106-53.72 03.22 -0.35 11 04 088 0.1 000.5001.2 a a a
880408 0745 17.90 34-16.34 106-53.09 02.58 -0.07 11 07 112 0.08000.5002.5 b b b
880410 0226 35.67 34-17.94 106-48.89 07.38 -0.46 10 09 146 0.13000.8001.9 b a c
880422 1650 13.72 34-17.72 106-49.33 07.64 00.96 16 08 111 0.16000.6001.7 b b b
880426 1738 43.24 34-20.29 106-52.55 04.49 -0.24 11 02 171 0.14001.0000.8 b a c
880508 1159 45.86 34-18.39 106-48.43 10.81 01.03 13 09 116 0.10000.4001.0 b a b
880510 1122 50.00 34-16.99 106-49.41 05.05 00.12 12 09 128 0.11000.6001.7 b a b
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880516 0019 02.80 34–19.20 106–52.15 06.16 00.03 14 03 145 0.15000.6001.0 b a c
880531 0459 03.51 34–19.02 106–52.64 05.14 00.05 15 03 115 0.15000.5000.9 b a b

1982 (second half) hypocenters

1982 (second half) Hypocenters

| DATE | TIME | LOCATION | | DEPTH | MAG. | NO | DM | GAP | RMS | ERH | ERZ | QUALITY |
		LATITUDE	LONGITUDE	KM.								
820604	1021 20.81	34-14.06	106-54.43	10.92	00.12	05	18	154	0.05	000.9	002.7	c b d
820728	1244 09.09	34-17.93	106-48.62	07.00	00.24	07	16	118	0.24	001.4	006.8	c c c
820816	1225 06.24	34-14.44	106-50.70	31.32	-0.32	07	21	153	1.06	008.0	015.0	d d c
820824	0758 36.00	34-17.37	106-53.09	13.74	01.13	06	23	121	0.02	000.2	000.9	b a b
820825	0427 33.53	34-18.87	106-48.51	02.87	-0.34	06	16	187	0.13	001.2	010.2	d c d
820826	0655 30.38	34-18.87	106-47.35	07.00	00.10	08	14	119	0.81	007.6	028.2	d d c
820826	1457 18.07	34-18.87	106-49.70	13.69	00.26	08	18	230	1.05	011.1	023.0	d d d
820903	2111 33.54	34-22.57	106-52.88	02.09	01.17	07	34	246	0.08	000.5	007.8	d c d
820905	2350 54.58	34-17.31	106-49.35	09.90	-1.25	06	24	224	0.06	000.9	002.3	c b d
820911	1352 14.65	34-14.90	106-50.90	00.37	-0.67	05	21	268	0.72	012.5	*****	d d d
820918	0339 37.57	34-18.08	106-47.99	13.07	01.94	11	15	065	0.24	001.4	004.6	b b b
820918	0341 14.63	34-18.14	106-48.92	07.00	02.15	10	17	066	0.21	001.2	006.9	c c c
820923	1217 21.98	34-19.44	106-46.97	17.26	-0.51	06	14	192	0.12	001.9	003.0	c b d
820927	1459 56.85	34-18.28	106-48.70	07.00	00.58	13	16	066	0.27	001.0	006.0	c c c
821007	1241 25.99	34-18.53	106-48.91	03.73	02.36	12	17	067	0.20	001.0	008.9	c c c
821007	1616 40.08	34-18.47	106-49.19	07.00	00.29	12	17	067	0.29	001.2	007.6	c c c
821015	1929 36.53	34-17.00	106-48.92	04.80	-0.35	06	17	170	0.07	000.6	005.4	c c c
821017	0601 10.98	34-17.45	106-48.15	11.35	-1.18	06	16	173	0.06	000.4	001.0	b a c
821017	1526 19.06	34-17.96	106-48.46	10.83	-0.83	07	16	178	0.04	000.3	000.9	b a c
821026	0104 33.69	34-17.67	106-48.83	07.00	00.65	15	17	065	001.0	01.0	004.8	c b c
821026	0118 20.18	34-16.81	106-48.92	06.94	-0.66	07	17	169	0.02	000.1	000.7	b a c
821031	0825 28.06	34-17.27	106-51.36	07.00	-0.33	07	21	107	0.49	003.9	018.1	c c c
821103	0922 27.08	34-17.99	106-46.91	15.86	01.13	14	14	063	0.26	001.1	002.9	b b a
821104	2038 06.54	34-18.87	106-52.78	00.16	-0.19	06	23	289	1.47	021.5	*****	d d d
821106	0229 29.50	34-22.30	106-54.06	02.83	00.98	18	25	083	0.32	000.9	014.5	c c c
821106	1651 11.07	34-21.86	106-54.19	13.60	00.77	16	25	127	0.26	000.9	003.0	b b b
821108	0910 00.51	34-17.93	106-49.21	02.60	-0.10	09	17	119	0.18	001.0	011.4	c c c
821110	1621 26.57	34-17.06	106-48.47	14.88	-0.72	05	23	225	0.03	000.6	001.4	c a d
821117	2056 38.18	34-18.87	106-47.03	07.00	-0.25	07	14	186	0.23	002.8	008.8	d c d
821119	1418 15.18	34-16.50	106-49.80	01.63	00.57	06	19	167	0.28	001.3	023.5	c c c
821119	1530 48.29	34-18.08	106-48.58	07.00	00.07	09	16	118	0.25	001.2	007.1	c c c
821121	1433 43.02	34-17.29	106-49.06	07.00	-0.39	07	17	173	0.15	001.0	004.8	c b c
821125	0210 19.99	34-17.73	106-48.06	10.59	-0.14	09	16	117	0.08	000.5	001.3	b a b
821129	2141 50.17	34-18.87	106-47.09	16.21	-0.05	08	14	186	0.17	001.4	002.4	c b d
821130	0458 49.27	34-16.53	106-42.35	16.94	-0.68	06	08	234	0.04	002.0	000.9	c b d
821205	0312 15.11	34-15.78	106-49.59	07.00	-0.49	07	19	125	0.38	002.6	013.0	c c c
821206	2212 34.59	34-15.97	106-50.00	02.27	-0.19	08	23	261	0.20	001.2	012.6	d c d
821207	1436 02.81	34-17.46	106-49.37	07.00	00.73	10	18	109	0.21	001.0	007.4	c c c

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821208 2150 26.45 34-16.98 106-49.37 08.46 -0.55 09 18 145 0.08000.6001.9 b a c
821208 2153 13.02 34-16.94 106-49.31 07.00 -0.55 09 18 145 0.12000.7003.1 c b c
821211 0728 19.88 34-18.00 106-47.56 07.00 00.65 11 29 149 0.19001.2007.7 c c c
821220 0041 19.80 34-16.58 106-54.52 00.72 -0.97 05 25 183 0.44001.2044.7 d c d
821220 0424 12.40 34-17.09 106-49.24 07.00 -0.41 10 17 146 0.14000.7003.6 c b c
821230 0147 58.81 34-17.61 106-48.38 11.60 00.55 14 16 151 0.20000.8002.6 c b c
821230 0205 36.31 34-17.78 106-48.78 12.48 00.04 12 17 152 0.17000.7002.0 c b c
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1983 hypocenters

1983 Hypocenters

DATE	TIME	LOCATION LATITUDE	LONGITUDE	DEPTH KM.	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY
830101	0301 25.21	34-18.07	106-49.70	04.54	00.22	06	26	272	0.06	001.20	06.9	d c d
830102	0151 54.01	34-21.99	106-54.60	07.00	00.57	16	21	127	0.22	000.80	03.9	c b c
830109	1322 22.71	34-18.40	106-50.64	07.00	-0.78	05	19	282	0.09	005.20	14.5	d d d
830109	2200 09.81	34-17.83	106-48.32	10.99	-0.21	09	16	153	0.11	000.70	02.0	c b c
830112	2102 23.30	34-16.69	106-48.55	07.00	-0.32	11	17	142	0.26	001.20	05.7	c c c
830117	0945 29.67	34-22.41	106-54.59	07.00	00.33	17	21	129	0.37	001.20	05.7	c c c
830212	1407 23.90	34-17.00	106-48.97	07.00	-0.24	09	17	145	0.08	000.30	01.7	b a c
830213	0505 11.55	34-14.15	106-52.31	07.00	00.47	13	24	090	0.42	001.40	10.5	c c c
830213	0821 08.45	34-18.17	106-49.78	07.00	00.57	07	18	155	0.38	003.90	23.8	c c c
830225	0257 54.31	34-16.75	106-52.99	13.24	02.44	11	23	103	0.35	001.80	06.1	c c b
830225	0849 55.51	34-17.03	106-53.83	07.00	01.85	11	24	144	0.28	001.40	07.6	c c c
830225	0912 24.93	34-16.93	106-53.37	00.56	00.64	11	24	145	0.46	002.31	15.7	c c c
830226	1115 41.05	34-18.57	106-52.41	11.57	03.04	21	22	058	0.23	000.70	02.9	b b b
830226	1118 20.05	34-18.11	106-52.81	07.00	00.17	12	23	110	0.24	001.10	06.2	c c c
830226	1120 56.26	34-18.34	106-52.93	00.74	00.87	13	23	111	0.44	001.80	56.7	c c c
830226	1136 44.35	34-17.74	106-52.41	01.39	01.53	15	22	108	0.32	001.00	27.1	c c c
830226	1553 38.03	34-17.60	106-52.88	01.40	01.47	14	23	107	0.54	001.70	42.8	d d c
830226	1608 24.59	34-17.57	106-52.48	07.00	00.36	10	22	108	0.19	001.00	05.1	c c c
830226	1719 43.45	34-18.03	106-53.17	00.30	01.06	13	23	109	0.37	001.54	46.0	c c c
830226	1739 33.08	34-16.96	106-53.20	00.71	00.69	15	24	104	0.55	001.50	55.7	d d c
830226	1900 42.48	34-18.56	106-52.33	07.00	01.44	11	22	113	0.22	001.00	05.8	c c c
830226	2015 20.50	34-18.12	106-52.70	01.94	00.59	09	23	152	0.14	000.90	15.6	c c c
830226	2223 23.23	34-17.84	106-52.37	07.00	00.69	14	22	109	0.46	001.60	08.4	c c c
830227	0836 23.26	34-18.25	106-53.68	00.13	-0.02	06	24	288	0.15	002.22	61.6	d c d
830227	1545 57.75	34-18.10	106-51.29	07.00	-0.08	05	20	283	0.01	000.90	03.2	c b d
830227	1548 49.19	34-18.25	106-52.83	07.00	-0.14	06	23	287	0.15	003.30	10.8	d c d
830228	0645 23.55	34-17.73	106-51.31	10.91	00.15	09	20	150	0.10	000.70	02.2	c b c
830228	0721 35.37	34-18.02	106-50.63	11.97	00.39	10	19	153	0.35	002.30	06.3	c c c
830228	1204 40.03	34-17.72	106-52.70	07.00	00.82	15	23	108	0.19	000.60	03.3	c b c
830228	1349 13.40	34-17.27	106-53.19	01.32	01.56	13	23	105	0.23	000.90	23.7	c c c
830228	2247 42.62	34-13.82	106-53.99	13.64	-0.08	12	18	119	1.35	005.30	18.5	c d b
830228	2312 42.07	34-17.89	106-52.80	04.71	02.29	13	23	109	0.11	000.40	03.5	c b c
830301	0816 18.73	34-18.64	106-52.75	07.00	-0.11	05	23	288	0.10	001.90	07.6	d c d
830302	1334 05.44	34-18.44	106-52.98	09.89	-0.17	09	23	154	0.13	000.90	03.1	c b c
830302	2322 18.61	34-18.26	106-52.48	20.70	04.20	17	22	056	0.38	001.60	04.2	c c b
830303	1119 00.05	34-18.29	106-52.10	07.00	01.67	10	02	112	0.08	000.50	00.6	b a b
830303	1607 00.04	34-18.08	106-51.78	07.57	01.00	10	02	106	0.07	000.50	00.6	b a b
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830303 2235 00.02 34-17.92 106-52.58 04.51 01.02 11 01 094 0.05000.3000.4 b a b
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830324 0153 33.09 34-19.84 106-50.89 22.12 00.41 07 20 169 00.9001.3001.9 c a b
830324 0245 23.66 34-17.71 106-52.75 07.00 -0.07 06 23 149 0.09001.1006.2 c c c
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830704 2024 58.99 34−21.42 106−49.59 23.69 00.30 12 18 186 0.62003.7005.2 d d d
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830812 0253 25.60 34−17.19 106−53.50 11.88 00.43 11 24 144 0.20001.0003.2 c b c
830822 1321 05.92 34−17.51 106−53.50 07.00 00.03 11 24 146 0.18000.7003.5 c b c
830826 0329 05.30 34−17.65 106−51.99 07.00 00.67 13 22 149 0.53002.3012.5 d d c
830830 0433 42.64 34−13.94 106−48.65 25.23 −0.48 05 19 119 1.12030.4105.7 d d d
830912 1029 13.65 34−17.44 106−52.10 07.00 00.89 14 22 147 0.33001.4007.5 c c c
830913 0228 09.01 34−17.11 106−51.75 10.99 00.11 12 21 145 0.09000.4001.3 b a c
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830923 0532 50.72 34−16.65 106−51.90 00.31 −0.06 10 22 141 0.18000.9226.3 c c c
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831024 1718 20.21 34−19.18 106−50.88 13.55 −0.32 13 20 163 0.19000.8002.9 c b c
831106 1926 17.03 34−20.10 106−49.29 14.22 −0.16 13 17 174 0.15000.7001.5 b a c
831107 0149 37.32 34−18.87 106−50.00 07.00 −0.04 12 18 162 0.22001.0004.4 c b c
831126 2240 26.68 34−18.08 106−52.79 07.00 00.27 15 23 152 0.32001.1005.5 c c c
831217 2003 15.43 34−18.87 106−53.17 14.22 −0.02 12 23 158 0.20000.8002.4 c b c
831225 1930 46.93 34−17.75 106−51.54 12.82 −0.25 08 21 178 0.31002.1007.7 c c c
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1984 hypocenters

1984 Hypocenters

DATE	TIME	LOCATION		DEPTH	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY
		LATITUDE	LONGITUDE	KM.								

840123	0446	22.76	34–17.56	106–50.79	07.00	–0.25	12	20	149	0.28	001.2	006.2	c c c
840126	0823	09.77	34–17.01	106–54.02	11.91	–0.02	10	24	142	0.12	000.6	001.9	b a c
840201	0454	00.05	34–18.44	106–48.48	12.79	–0.78	05	16	159	0.03	000.5	001.2	c a d
840223	1335	06.77	34–20.80	106–52.46	11.66	–0.47	12	22	176	0.27	001.2	003.6	c b c
840301	1133	10.49	34–17.08	106–51.09	01.29	–0.62	04	20	169	0.07	**********		c a d
840323	2354	47.94	34–18.18	106–52.81	01.28	–0.58	04	23	153	0.01	**********		c a d
840327	0506	15.29	34–15.57	106–55.00	10.26	–0.56	09	21	130	0.13	000.7	002.4	c b c
840414	1329	15.50	34–19.52	106–54.45	07.00	–0.10	09	23	161	0.17	000.9	004.4	c b c
840418	0956	47.92	34–14.06	106–54.05	12.08	–0.02	12	18	120	0.21	000.8	002.7	b b b
840421	2055	49.02	34–17.89	106–52.98	00.76	–0.33	06	23	159	0.10	000.9	033.6	c c c
840423	1148	46.02	34–17.72	106–51.90	12.85	–0.44	07	21	198	0.13	001.2	002.8	c b d
840425	0418	24.73	34–17.38	106–53.92	00.06	–0.15	06	25	161	0.17	001.7	281.8	c c c
840425	0942	20.14	34–15.10	106–53.43	18.80	–0.18	11	21	128	0.20	001.0	002.1	b b b
840425	1036	14.14	34–17.08	106–53.12	09.98	–0.44	11	23	143	0.11	000.5	002.0	c b c
840426	1140	16.05	34–18.99	106–52.53	07.00	–0.43	07	22	160	0.25	001.4	008.5	c c c
840428	1046	06.70	34–17.83	106–53.11	11.08	–0.55	10	23	149	0.14	000.7	002.3	c b c
840430	2115	52.19	34–18.02	106–53.11	12.21	–0.30	07	23	151	0.07	000.8	002.9	c b c
840516	0351	22.95	34–19.56	106–49.22	07.00	–0.38	06	17	169	0.14	001.6	008.6	c c c
840516	1104	04.79	34–23.21	106–54.46	07.00	00.47	09	21	193	0.14	000.9	004.0	c b d
840525	1036	14.76	34–15.87	106–52.57	01.38	00.08	08	23	134	0.17	000.9	025.8	c c c
840525	1119	50.74	34–16.20	106–52.71	07.00	–0.18	05	23	137	0.14	003.0	022.3	d c d
840526	0821	37.57	34–18.87	106–50.20	07.00	–0.52	08	19	161	0.19	001.5	007.4	c c c
840530	0517	12.11	34–18.36	106–52.80	07.00	00.18	13	23	154	0.18	000.7	004.0	c b c
840530	0652	09.33	34–16.20	106–53.16	01.15	00.11	11	23	136	0.32	001.5	047.7	c c c
840703	1908	11.78	34–17.80	106–52.90	10.59	00.26	08	23	149	0.07	000.5	002.1	c b c
840727	2040	49.93	34–17.22	106–53.06	07.00	–0.73	07	23	144	0.19	002.5	017.1	c c c
840811	1458	16.45	34–19.88	106–49.67	16.55	–0.49	09	18	171	0.11	000.8	001.5	b a c
840811	1502	16.37	34–19.63	106–49.02	20.20	–0.52	07	17	170	0.07	000.7	001.2	b a c
840826	0219	54.23	34–18.87	106–48.44	16.87	02.49	12	16	066	0.17	000.9	002.8	b b a
840826	0714	51.37	34–18.26	106–48.08	12.04	00.07	08	15	116	0.20	001.1	003.1	b b b
840826	2122	23.52	34–18.27	106–48.77	07.00	–0.45	08	17	157	0.21	001.7	010.4	c c c
840828	2349	26.87	34–18.32	106–48.81	07.00	–0.19	10	17	157	0.12	000.7	003.1	c b c
840903	0631	14.39	34–19.93	106–53.48	02.80	00.43	13	24	119	0.16	000.7	007.8	c c c
840907	1358	43.20	34–18.87	106–48.53	07.00	00.67	09	16	120	0.25	001.5	007.0	c c c
840908	0145	10.34	34–15.61	106–49.28	07.00	–0.27	06	18	133	0.22	001.8	009.2	c c c
840908	1333	33.67	34–18.87	106–52.93	12.86	*****	04	23	163	0.33	**********		d c d
840908	2150	22.90	34–18.87	106–48.86	07.00	–0.66	06	17	163	0.30	004.4	012.0	c c c
840908	2237	09.07	34–18.20	106–49.30	07.00	–0.70	06	17	156	0.34	004.1	013.4	c c c

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840909 1052 54.63 34-17.85 106-53.68 12.31 -0.43 08 24 149 0.13000.9003.0 c b c
840911 1007 50.07 34-18.87 106-53.89 19.22 00.02 05 24 157 0.18003.8008.9 d c d
840912 0955 05.75 34-18.47 106-51.70 07.00 -0.19 12 21 156 1.47005.9034.7 d d c
840913 0715 56.27 34-21.31 106-52.90 20.04 -0.59 06 23 179 0.45005.1008.6 d d c
840915 2054 27.88 34-17.34 106-48.72 03.05 -0.55 08 17 148 0.17000.9010.1 c c c
840916 2119 29.78 34-18.21 106-47.61 07.00 -0.46 07 15 157 0.17001.9008.6 c c c
840917 1249 25.61 34-15.09 106-54.54 01.36 -0.06 07 26 137 0.18001.3033.4 c c c
840919 0327 04.74 37-19.05 106-49.95 07.55 00.06 11 06 163 0.10000.6000.8 b a c
840924 1234 53.52 34-18.08 106-48.96 07.00 -0.43 08 17 155 0.25001.7007.7 c c c
841011 0849 05.41 34-18.58 106-48.92 12.04 -0.17 07 08 157 0.12001.0002.1 c b c
841013 0011 28.94 34-20.29 106-54.82 12.19 -0.29 10 02 167 0.80004.6005.7 d d c
841029 2341 57.35 34-20.90 106-47.26 07.00 00.69 13 10 138 0.31001.4004.2 c c c
841105 0845 59.92 34-18.59 106-48.24 12.82 02.10 09 09 118 0.16001.100.23 b b b
841105 0848 19.32 34-20.29 106-48.78 18.84 00.34 04 08 176 0.00********** c a d
841105 1300 10.74 34-18.65 106-48.89 11.38 01.76 09 08 118 0.15001.1002.3 b b b
841203 1335 21.39 34-17.88 106-48.02 08.95 00.56 11 10 148 0.21001.0002.9 c b c
841206 0344 19.15 34-16.12 106-52.60 02.56 00.57 12 08 091 0.22001.0007.2 c c b
841206 0527 21.02 34-16.98 106-52.99 07.85 00.06 11 06 093 0.14000.8001.9 b a b
841215 0001 31.45 34-18.03 106-51.29 08.04 00.50 16 05 111 0.13000.4001.2 b a b
841217 0535 29.29 34-14.59 106-50.16 01.52 -0.12 07 12 138 0.15000.7009.8 c c c
841217 0615 40.03 34-15.13 106-49.88 09.56 00.14 14 11 102 0.17000.6001.7 b b b
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1985 hypocenters

1985 Hypocenters

DATE	TIME	LOCATION		DEPTH KM.	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY
		LATITUDE	LONGITUDE									
850110	0730 17.13	34-14.35	106-54.53	11.27	-0.02	11	11	066	0.25	001.0	003.4	b b a
850111	0006 03.97	34-15.57	106-53.85	11.02	00.75	12	09	075	0.19	000.8	002.1	b b a
850111	0056 40.33	34-14.09	106-55.58	03.22	-0.21	10	12	163	0.35	002.1	012.6	c c c
850111	0132 43.53	34-15.62	106-53.85	13.42	-0.23	11	08	117	0.28	001.3	002.6	b b b
850112	1309 08.30	34-18.87	106-44.17	16.01	-0.11	07	09	166	0.31	003.6	004.1	c c c
850205	0245 22.35	34-15.59	106-53.27	10.64	00.62	12	09	081	0.14	000.7	002.1	b b a
850205	0449 31.53	34-15.67	106-53.02	11.03	00.95	14	08	084	0.20	000.8	002.6	b b a
850211	0939 11.51	34-14.30	106-53.57	00.12	00.32	08	11	195	0.14	001.0	194.0	d c d
850212	0658 08.41	34-18.49	106-52.25	07.80	-0.20	04	04	166	0.00	**********		c a d
850303	2121 46.13	34-14.26	106-50.47	14.51	00.35	06	21	123	0.10	000.9	003.0	b b b
850316	0251 08.75	34-14.38	106-53.85	02.26	00.27	07	11	195	0.19	002.1	015.4	d c d
850316	1752 19.68	34-17.97	106-49.69	10.79	00.03	07	07	142	0.17	001.3	003.7	c b c
850319	2143 29.67	34-18.87	106-44.09	07.00	00.92	11	09	125	0.36	002.3	005.6	c c b
850320	2048 09.22	34-19.03	106-52.37	06.33	00.28	10	03	136	0.09	000.5	000.9	b a c
850327	1949 28.04	34-15.89	106-53.16	09.92	00.61	08	08	145	0.07	000.5	001.2	b a c
850403	0908 33.61	34-15.26	106-52.83	07.00	-0.05	06	09	186	0.05	000.7	001.3	c a d
850403	1057 00.07	34-20.29	106-51.46	08.83	-0.35	04	04	172	0.01	**********		c a d
850408	1245 15.93	34-18.39	106-52.52	11.97	00.15	12	04	118	0.14	000.7	001.5	b a b
850409	0559 24.44	34-14.83	106-53.18	08.47	00.54	10	10	078	0.09	000.4	001.5	b a b
850410	0729 35.59	34-14.48	106-50.79	07.00	00.12	11	11	094	0.15	000.7	002.3	b b b
850411	0117 52.43	34-14.05	106-51.81	03.19	-0.04	12	12	098	0.16	000.7	005.0	c b c
850418	0607 01.83	34-14.24	106-51.28	07.00	-0.05	07	12	096	0.09	000.7	003.2	b b b
850418	1057 37.25	34-17.39	106-51.28	16.03	00.86	15	06	119	0.27	000.7	001.8	b b b
850419	0347 15.93	34-15.56	106-53.57	05.35	00.02	09	09	094	0.17	001.0	003.9	b b b
850420	0819 14.00	34-14.88	106-52.28	07.00	00.45	06	10	136	0.05	000.6	001.8	b a c
850423	1010 39.05	34-20.29	106-51.10	05.92	00.39	10	04	173	0.14	000.9	001.6	b a c
850425	1611 18.84	34-15.80	106-53.13	06.02	01.03	11	08	083	0.20	000.8	004.3	b b b
850429	0540 57.36	34-18.03	106-53.38	10.37	00.49	13	04	095	0.19	000.8	001.3	b b b
850504	1339 30.55	34-18.60	106-50.19	07.68	00.13	08	06	151	0.18	001.3	003.1	c b c
850517	1148 58.73	34-14.76	106-52.75	07.00	00.24	11	10	096	0.22	001.0	004.2	b b b
850517	1724 38.66	34-14.59	106-52.75	02.39	00.08	10	10	097	0.15	000.8	008.6	c c c
850517	1812 52.07	34-15.32	106-52.57	10.32	00.32	08	09	094	0.13	000.9	002.6	b b b
850524	0621 38.77	34-15.25	106-52.16	10.64	-0.03	07	09	093	0.04	000.5	001.2	b a b
850524	0817 57.95	34-14.45	106-52.76	07.00	-0.21	07	11	140	0.04	000.4	001.5	b a c
850612	1317 52.03	34-17.63	106-53.73	05.76	-0.10	07	05	120	0.08	000.9	001.6	b a b
850617	2103 48.56	34-16.09	106-52.23	01.48	00.82	09	08	122	0.30	002.4	028.5	c c b
850617	2249 58.87	34-15.57	106-53.07	00.87	-0.09	10	09	133	0.19	001.1	017.8	c c b
850618	1337 58.58	34-16.31	106-52.68	02.02	-0.61	08	07	128	0.11	001.0	004.4	b b b

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850618 1344 21.88 34-16.42 106-52.69 03.56 -0.38 08 07 127 0.15001.5003.9 b b b
850621 0656 03.53 34-14.97 106-53.85 00.66 00.03 11 10 077 0.21001.0025.0 c c b
850624 2135 12.17 34-17.10 106-52.05 13.95 00.24 07 06 106 0.26002.5005.5 c c b
850709 0529 59.70 34-16.79 106-52.05 05.24 -0.17 10 07 103 0.2100.10004.0 b b b
850710 0900 51.17 34-16.56 106-52.08 01.46 -0.11 12 07 100 0.24000.8010.5 c c b
850714 1446 48.29 34-16.27 106-47.36 07.00 -0.46 03 12 154 0.01********** c a d
850717 1728 15.24 34-15.95 106-54.44 04.77 00.17 08 08 104 0.05000.3001.3 b a b
850717 1738 59.76 34-16.65 106-53.32 03.66 00.18 11 07 096 0.28001.1005.3 c c b
850719 0014 25.47 34-16.78 106-52.80 00.42 -0.31 07 06 126 0.28001.2027.5 c c b
850726 2143 16.22 34-19.52 106-50.39 10.51 -0.42 07 05 167 0.30002.4005.1 c c c
850728 0353 46.36 34-14.34 106-52.53 01.36 00.32 10 11 080 0.23000.9015.4 c c c
850730 0840 08.08 34-16.16 106-53.85 01.67 -0.33 08 07 084 0.17000.9008.7 c c b
850808 0819 14.58 34-15.00 106-52.59 06.64 00.37 11 10 083 0.20000.9002.7 b b b
850808 2157 26.22 34-15.29 106-53.85 09.69 -0.19 08 09 116 0.12000.7001.4 b a b
850811 0626 38.45 34-14.02 106-51.91 07.00 -0.64 08 12 088 0.15000.9003.2 b b b
850816 1106 48.52 34-15.97 106-50.88 05.73 01.32 13 09 099 0.16000.7002.7 b b b
850921 0600 27.08 34-19.03 106-52.10 07.00 00.14 15 19 116 0.11000.4001.7 b a c
850922 1301 20.38 34-18.27 106-51.77 05.44 ***** 13 05 128 0.15000.6001.7 b b b
850923 0211 47.44 34-19.38 106-52.32 07.00 00.33 12 03 149 0.11000.6001.1 b a c
850925 0734 37.36 34-19.16 106-52.14 07.00 00.07 09 03 144 0.12000.7001.4 b a c
850927 0133 10.09 34-19.27 106-52.07 13.97 00.79 13 20 117 0.14000.6001.9 b a b
850927 0806 14.39 34-19.18 106-52.42 04.79 00.55 15 19 116 0.18000.6003.5 c b c
850929 1610 39.72 34-19.63 106-52.21 07.00 00.56 10 20 166 0.10000.6002.3 c b c
851003 0121 33.82 34-18.43 106-52.92 04.24 00.05 07 03 116 0.14001.4002.4 b b b
851003 1633 17.08 34-17.30 106-49.37 12.60 01.55 14 09 108 0.13000.5001.2 b a b
851006 0256 24.37 34-20.97 106-47.71 16.85 -0.03 08 09 204 0.11001.1001.7 c b d
851018 0616 05.63 34-17.94 106-51.38 05.78 -0.17 10 06 127 0.12000.6001.6 b a b
851023 1916 37.01 34-17.39 106-48.82 09.36 00.17 12 09 137 0.09000.4001.1 b a c
851025 2253 54.06 34-18.27 106-54.60 07.00 -0.15 08 04 138 0.17001.2001.9 c b c
851026 0740 32.38 34-14.10 106-51.79 01.09 00.19 09 12 110 0.10000.8018.2 c c c
851031 1812 34.99 34-16.64 106-48.90 10.85 00.35 08 10 104 0.09000.8001.5 b a b
851102 1516 18.25 34-17.53 106-48.63 12.59 00.74 14 09 110 0.12000.5001.3 b a b
851102 2002 54.00 34-17.03 106-49.09 11.35 -0.31 08 09 130 0.13000.9002.3 b b b
851107 0305 38.70 34-20.49 106-53.22 10.21 00.71 09 01 200 0.21001.9001.8 c b d
851108 1619 41.59 34-14.05 106-53.02 03.40 00.47 11 11 119 0.29001.3007.5 c c c
851110 0143 25.95 34-15.12 106-54.47 10.63 -0.16 11 09 075 0.15000.7001.5 a a a
851120 0343 44.72 34-20.07 106-49.44 08.83 00.13 07 07 173 0.07000.8001.4 b a c
851127 1352 28.05 34-15.73 106-53.29 06.48 00.36 11 08 097 0.10000.4001.4 b a b
851201 2237 47.21 34-15.90 106-53.22 07.15 00.30 12 08 083 0.14000.6001.6 b a b
851202 0016 58.47 34-17.90 106-48.29 11.11 00.70 10 09 147 0.26001.4003.3 c b c
851213 1207 41.95 34-15.61 106-50.88 22.54 00.85 11 10 101 0.21001.2002.2 b b b
851213 1457 13.05 34-14.56 106-51.42 20.00 00.36 10 21 125 0.23001.3003.0 b b b
851214 0138 00.63 34-13.83 106-51.68 14.94 00.71 10 12 103 0.10000.6001.6 b a b
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851214 0313 42.55 34-13.90 106-51.98 18.75 00.53 08 12 104 0.10000.8002.0 b a b
851214 0412 47.41 34-13.12 106-51.91 20.16 00.09 07 13 151 0.37003.0007.1 c c c
851215 0201 13.55 34-17.82 106-54.78 07.00 00.20 09 05 081 0.15001.0002.2 b b a
851228 2009 23.84 34-16.70 106-52.35 07.75 00.16 11 07 098 0.13000.6001.6 b a b
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1986 hypocenters

1986 Hypocenters

DATE	TIME	LOCATION LATITUDE	LONGITUDE	DEPTH KM.	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY
860103	0721 04.85	34−16.43	106−55.01	05.02	00.03	12	07	071	0.14	000.5	001.5	b a b
860103	1001 44.23	34−16.34	106−54.74	05.70	−0.01	11	07	087	0.15	000.6	001.4	b a b
860104	0158 07.14	34−16.48	106−54.94	05.53	00.17	09	07	123	0.10	000.5	001.1	b a b
860109	2331 18.95	34−16.54	106−55.09	07.79	00.24	14	07	067	0.15	000.5	001.1	b b a
860111	0158 02.63	34−16.38	106−54.57	06.11	00.31	14	07	070	0.10	000.3	000.9	b a b
860111	0221 48.33	34−16.48	106−55.02	06.20	00.20	14	07	071	0.14	000.5	001.1	b a b
860112	2224 43.60	34−18.69	106−53.32	04.58	00.09	09	03	103	0.08	000.4	000.9	b a b
860127	1307 42.27	34−14.36	106−48.61	10.63	−0.11	11	17	123	0.08	000.3	001.0	b a b
860131	0612 53.41	34−18.95	106−50.98	09.41	00.18	10	05	153	0.10	000.5	001.2	b a c
860131	0728 02.83	34−18.89	106−50.36	07.00	00.25	11	06	156	0.20	001.0	002.4	c b c
860202	0418 57.57	34−19.58	106−53.48	07.00	00.52	14	01	114	0.20	000.8	001.5	b b b
860409	0936 17.67	34−14.90	106−53.39	06.31	00.22	11	10	076	0.18	000.8	002.9	b b b
860411	1229 24.85	34−16.88	106−52.83	07.00	−0.11	11	06	094	0.10	000.4	001.2	b a b
860412	0401 49.89	34−18.31	106−50.50	07.00	00.66	14	06	114	0.20	000.7	002.0	b b b
860413	1540 44.74	34−21.34	106−46.99	10.99	00.46	09	11	190	0.20	001.6	003.3	c b d
860426	1614 35.35	34−16.28	106−53.18	08.44	00.41	10	07	087	0.10	000.4	001.3	a a a
860510	1156 11.09	34−17.95	106−51.79	01.88	00.24	10	05	122	0.13	000.6	003.8	b b b
860510	2241 01.89	34−19.29	106−55.02	05.67	00.86	13	03	116	0.13	000.6	001.2	b a b
860521	1345 29.92	34−20.31	106−48.01	09.28	00.77	13	09	131	0.15	000.6	001.5	b a b
860522	1344 29.54	34−18.72	106−54.28	04.59	00.49	10	03	082	0.11	000.6	001.2	a a a
860523	2308 32.80	34−18.68	106−54.70	03.91	00.67	11	03	092	0.04	000.2	000.5	b a b
860601	2047 56.70	34−18.97	106−54.71	07.00	00.09	09	03	099	0.07	000.4	000.9	b a b
860616	2011 40.98	34−17.63	106−53.02	00.71	00.06	09	05	098	0.17	000.7	009.9	c c b
860627	1624 14.27	34−17.53	106−53.16	00.25	00.61	10	05	095	0.11	000.6	019.9	c c b
860728	0741 21.94	34−19.09	106−52.10	00.66	00.08	10	03	183	0.08	000.3	002.5	c b d
860807	0301 50.86	34−17.72	106−53.50	00.32	00.12	09	05	090	0.09	000.4	010.9	c c b
860814	2254 58.74	34−16.17	106−51.37	07.00	00.14	08	16	137	0.07	000.5	002.3	c b c
860820	1003 57.51	34−17.92	106−51.09	04.60	00.06	11	06	130	0.10	000.5	001.6	b a b
860831	1418 55.94	34−17.25	106−51.44	00.81	−0.34	07	06	121	0.19	001.6	020.6	c c b
860901	0756 29.23	34−15.27	106−48.05	10.30	−0.65	08	17	129	0.08	000.5	001.6	b a b
860905	1313 20.69	34−22.32	106−52.12	07.00	−0.18	12	05	189	0.23	001.3	001.6	c b d
860921	1216 32.97	34−18.31	106−48.95	05.88	00.08	09	08	152	0.06	000.3	001.4	b a c
860925	1745 31.63	34−21.58	106−49.97	07.59	00.93	10	06	186	0.09	000.6	001.3	c a d
860926	1804 08.81	34−18.48	106−52.27	02.80	00.34	08	04	124	0.07	000.5	001.6	b a b
861007	2337 31.40	34−19.56	106−54.38	00.73	00.25	10	02	108	0.15	000.8	003.1	b b b
861013	1216 27.59	34−18.97	106−50.71	00.61	01.35	12	05	155	0.08	000.4	006.8	c c c
861014	0756 40.34	34−16.55	106−53.19	04.20	−0.30	08	07	133	0.08	000.5	001.6	b a b
861018	0459 20.09	34−20.29	106−51.06	00.23	00.43	12	04	173	0.13	000.6	014.4	c c c

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861019 0640 34.97 34-20.29 106-49.52 06.71 -0.55 10 06 175 0.13000.7001.7 b a c
861022 2343 49.54 34-15.06 106-54.98 07.00 00.17 10 10 095 0.08000.4001.4 b a b
861024 2041 35.60 34-17.82 106-54.88 02.27 00.22 08 05 082 0.10000.6002.7 b b a
861025 0005 37.78 34-17.85 106-54.76 02.99 01.09 15 05 081 0.14000.5002.2 b b a
861031 1516 29.82 34-21.39 106-48.54 11.18 01.72 12 08 138 0.11000.6001.2 b a c
861031 1521 35.82 34-21.20 106-48.67 03.63 01.65 11 08 136 0.21001.1005.2 c c c
861031 1723 22.68 34-21.02 106-47.89 08.76 00.02 09 09 185 0.07000.5001.1 c a d
861031 1735 06.84 34-21.00 106-48.49 08.04 00.86 14 08 135 0.12000.5001.4 b a c
861101 0458 41.79 34-20.29 106-49.61 10.97 00.21 08 06 175 0.26002.1003.5 c b c
861101 1422 11.96 34-16.15 106-53.58 02.48 00.62 13 07 080 0.20000.7004.6 b b b
861101 1709 45.11 34-21.53 106-48.01 07.14 00.25 11 09 190 0.11000.6001.5 c a d
861125 0526 20.16 34-20.29 106-53.85 05.31 00.14 10 00 169 0.27001.5002.3 c b c
861126 1200 30.07 34-16.19 106-53.85 00.92 -0.27 08 07 092 0.16000.8012.2 c c b
861130 0014 21.29 34-15.23 106-51.85 00.45 00.15 11 10 090 0.10000.4010.7 c c b
861220 1210 44.12 34-19.52 106-52.54 04.28 00.02 08 02 188 0.12001.0001.6 c a d
861221 0323 13.04 34-16.34 106-55.24 04.38 00.34 12 07 072 0.09000.3001.6 b a b
861221 0409 19.51 34-16.51 106-54.97 04.33 01.40 14 07 066 0.13000.5002.0 b a b
861222 0314 09.37 34-16.28 106-55.45 00.29 00.80 15 08 060 0.13000.4016.9 c c b
861222 0624 18.94 34-16.14 106-55.06 00.86 01.80 11 08 124 0.12000.6007.3 c c b
861222 1629 43.73 34-16.22 106-54.87 00.89 01.21 09 08 124 0.13000.7009.1 c c b
861223 2257 59.47 34-16.05 106-54.82 02.40 -0.24 10 08 088 0.07000.3002.1 b b b
861226 1340 45.11 34-15.95 106-54.78 00.70 00.09 08 08 106 0.08000.4009.0 c c b
861230 0450 57.42 34-19.34 106-49.89 04.71 00.46 14 06 121 0.22000.8003.0 b b b
861230 0542 02.48 34-16.64 106-49.47 11.45 00.23 11 09 122 0.12000.6001.6 b a b
861230 1003 06.19 34-18.93 106-53.17 04.30 00.05 12 03 112 0.27001.1002.5 b b b
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1987 hypocenters

1987 Hypocenters

DATE	TIME	LOCATION		DEPTH	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY
		LATITUDE	LONGITUDE	KM.								
870108	1905	46.09	34–16.64	106–53.31 05.39	00.84	16	07	086	0.11	000.4	001.4	b a b
870109	1900	09.76	34–17.08	106–54.80 02.15	00.29	10	06	082	0.11	000.5	003.4	b b b
870113	1211	18.06	34–16.20	106–53.12 03.70	–0.38	08	07	094	0.12	000.7	003.5	b b b
870116	1820	59.78	34–15.94	106–55.17 01.63	–0.62	08	08	087	0.05	000.3	003.7	b b b
870120	0642	39.36	34–15.72	106–54.99 07.00	00.76	12	08	065	0.12	000.5	001.7	b a b
870125	1918	48.48	34–17.88	106–54.04 08.68	00.06	10	04	119	0.10	000.5	001.1	b a b
870129	2332	43.54	34–16.49	106–48.35 01.17	00.63	08	11	126	0.08	000.5	009.5	c c c
870131	1326	07.96	34–17.82	106–49.34 00.94	00.08	11	08	141	0.12	000.5	009.1	c c c
870207	1159	39.09	34–17.91	106–47.24 07.00	00.00	07	11	151	0.05	000.6	001.7	b a c
870211	2040	51.37	34–17.25	106–48.93 07.15	–0.23	06	09	134	0.03	000.4	001.2	b a b
870213	0210	41.20	34–14.86	106–55.07 07.00	–0.56	09	10	096	0.08	000.4	001.6	b a b
870216	0548	41.72	34–20.60	106–52.65 04.18	–0.19	09	02	213	0.12	000.9	001.3	c a d
870217	1144	25.95	34–17.38	106–49.01 00.62	00.27	15	09	109	0.17	000.5	011.6	c c b
870228	1225	44.35	34–25.75	106–48.61 11.56	00.07	11	13	224	0.14	000.9	001.8	c a d
870314	0732	55.59	34–14.48	106–54.57 07.00	–0.03	09	11	080	0.08	000.4	001.8	b a b
870329	1656	55.09	34–18.70	106–52.49 03.92	00.37	08	03	125	0.14	000.8	001.9	b a b
870419	2336	53.17	34–17.79	106–51.34 04.63	00.37	09	06	125	0.05	000.2	000.9	b a b
870423	1635	57.91	34–18.82	106–48.44 07.00	–0.04	06	16	163	0.04	000.4	001.7	b a c
870428	0936	43.25	34–21.81	106–50.70 01.33	00.40	12	20	187	0.05	000.2	004.1	c b d
870509	1759	32.22	34–17.02	106–54.95 00.57	–0.47	10	06	082	0.05	000.2	003.5	b b b
870512	0622	48.14	34–17.01	106–52.54 00.82	–0.42	12	06	099	0.07	000.2	003.5	b b b
870527	1133	42.77	34–17.63	106–51.92 03.40	–0.16	11	06	115	0.09	000.4	001.6	b a b
870530	1153	04.00	34–18.61	106–49.90 04.65	–0.28	09	07	153	0.06	000.4	001.2	b a c
870608	0121	01.77	34–19.47	106–49.90 09.92	–0.46	11	06	167	0.20	001.0	002.3	c b c
870608	1800	12.03	34–18.71	106–50.25 03.77	–0.45	07	06	153	0.15	001.5	004.1	c b c
870706	1655	24.93	34–16.87	106–53.19 03.89	00.26	10	06	089	0.06	000.3	001.2	b a b
870707	1959	30.19	34–16.71	106–53.18 00.72	00.21	12	06	88	0.06	000.3	005.0	c c b
870709	2224	11.56	34–17.11	106–53.49 00.21	01.28	09	06	087	0.09	000.6	031.0	c c b
870714	1445	11.93	34–16.80	106–53.12 00.79	–0.41	13	06	090	0.08	000.2	003.9	b b b
870720	0338	36.00	34–21.81	106–48.79 09.40	–0.46	09	08	191	0.17	001.0	002.9	c b d
870722	2133	17.34	34–18.20	106–54.74 00.77	–0.06	11	04	097	0.08	000.3	003.4	b b b
870724	0532	01.98	34–18.50	106–54.68 00.78	–0.14	10	03	096	0.06	000.2	002.3	b b b
870725	0106	34.80	34–17.14	106–53.06 00.94	01.96	09	06	093	0.07	000.4	004.3	b b b
870725	0207	58.80	34–17.10	106–53.26 00.20	00.40	09	06	090	0.08	000.3	011.8	c c b
870725	0252	12.31	34–17.21	106–52.74 01.11	00.63	12	06	098	0.07	000.2	002.6	b b b
870725	0932	43.17	34–17.58	106–52.81 02.55	01.10	07	05	101	0.08	000.6	002.6	b b b
870725	1713	39.06	34–17.18	106–52.85 00.90	–0.70	07	06	097	0.06	000.3	004.3	b b b
870725	2007	51.14	34–17.15	106–53.13 00.50	–0.15	09	06	092	0.13	000.6	011.4	c c b

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870725 2053 34.22 34-16.93 106-53.08 01.62 00.09 08 26 091 0.17000.5004.0 b b b
870726 0113 40.83 34-17.75 106-48.51 00.65 00.42 09 16 112 0.05000.2005.7 c c c
870726 1312 33.23 34-17.26 106-53.65 00.42 01.06 10 05 085 0.07000.3007.7 c c b
870726 1341 48.96 34-16.95 106-53.08 00.62 -0.26 09 06 091 0.08000.4007.2 c c b
870728 1216 57.33 34-16.79 106-53.14 01.04 00.46 07 06 090 0.07000.4005.0 b b b
870810 2145 50.93 34-17.36 106-53.10 01.16 01.26 08 05 094 0.09000.5004.2 b b b
870816 0359 29.86 34-18.72 106-51.09 04.16 -0.31 06 05 146 0.07000.6002.1 c b c
870817 1515 10.67 34-18.46 106-50.32 03.69 -0.19 07 06 147 0.08000.6002.4 c b c
870818 2359 23.72 34-17.63 106-53.19 03.65 01.32 13 05 095 0.12000.5001.8 b a b
870825 0202 41.61 34-16.74 106-53.45 00.06 -0.73 08 15 140 0.25001.3355.5 c c c
870906 0431 28.21 34-17.53 106-49.45 06.82 -0.52 09 08 136 0.16000.7002.8 c b c
870906 0525 32.96 34-17.80 106-49.22 10.30 -0.65 09 08 142 0.13000.7002.0 c b c
870906 1113 52.31 34-17.56 106-49.18 09.43 -0.68 09 09 138 0.12000.6001.8 b a c
870907 0119 50.01 34-16.62 106-53.85 00.73 00.18 14 07 092 0.30001.0018.6 c c b
870917 1448 34.13 34-21.90 106-47.93 12.43 -0.24 11 09 193 0.18001.1002.1 c b d
871017 1211 30.35 34-16.42 106-52.58 03.39 -0.01 08 23 139 0.10000.6007.1 c c c
871103 1907 25.64 34-18.47 106-52.11 07.00 -0.24 12 04 127 0.24001.0002.3 b b b
871105 1053 17.99 34-18.49 106-52.06 07.00 -0.47 11 04 128 0.21001.1002.2 b b b
871202 0418 41.92 34-19.62 106-48.45 09.13 00.40 13 08 125 0.09000.4000.9 b a b
871202 0611 30.11 34-19.20 106-48.07 00.14 -0.11 10 15 167 0.12000.6148.9 c c c
871219 0830 38.58 34-20.06 106-52.42 02.98 00.24 14 02 169 0.10000.4000.6 b a c
871229 1726 29.02 34-20.95 106-47.50 02.33 00.02 12 10 204 0.15000.8004.2 c b d
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1988 (first half) hypocenters

1988 Hypocenters

DATE	TIME	LOCATION		DEPTH	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY
		LATITUDE	LONGITUDE	KM.								
80112	0228 50.10	34-19.05	106-53.38	6.31	0.59	13	02	144	0.09	000.6	000.8	b a c
80113	1851 53.67	34-17.79	106-53.47	0.84	0.22	13	04	091	0.11	000.4	003.7	b b b
80114	2303 30.80	34-19.13	106-52.84	4.35	1.89	10	02	154	0.06	000.4	000.6	b a c
80115	0337 54.29	34-18.35	106-53.37	0.93	0.40	09	17	153	0.11	000.6	019.9	c c c
80115	1640 35.72	34-18.05	106-53.33	2.33	0.43	15	04	096	0.13	000.4	001.5	b a b
80115	2053 50.58	34-17.56	106-53.06	1.00	0.13	12	05	138	0.14	000.4	003.4	c b c
80116	2107 43.98	34-18.02	106-53.17	3.09	0.45	10	04	122	0.10	000.5	001.1	b a b
80117	0514 49.31	34-18.39	106-53.85	3.22	0.90	15	03	086	0.13	000.5	001.5	a a a
80117	1501 09.68	34-18.21	106-53.11	6.22	0.11	09	04	103	0.08	000.4	000.8	b a b
80117	1854 19.73	34-17.25	106-53.32	1.13	0.16	09	05	109	0.09	000.4	002.7	b b b
80119	0159 18.92	34-18.19	106-53.44	0.65	0.04	17	04	095	0.10	000.2	003.2	b b b
80120	0732 10.38	34-18.88	106-53.29	6.00	0.23	10	03	145	0.15	000.9	001.2	b a c
80120	0921 25.24	34-18.02	106-52.94	0.82	0.24	17	04	144	0.14	000.5	004.0	c b c
80120	1031 10.11	34-17.97	106-53.02	1.11	0.14	07	04	142	0.12	000.7	004.9	c b c
80120	1903 49.57	34-18.18	106-53.46	3.08	0.05	16	04	094	0.09	000.3	000.8	b a b
80121	0544 33.64	34-18.01	106-53.50	0.35	0.29	15	04	092	0.08	000.3	004.7	b b b
80121	1519 26.79	34-18.79	106-53.18	7.00	0.47	15	03	109	0.14	000.5	000.8	b a b
80122	0840 57.80	34-17.66	106-53.10	2.55	0.37	10	05	125	0.07	000.3	001.3	b a b
80123	0947 06.29	34-18.01	106-53.41	0.70	0.42	13	04	094	0.09	000.2	002.5	b b b
80125	0546 13.90	34-18.56	106-53.32	3.75	0.67	09	03	101	0.15	000.8	001.8	b a b
80126	1005 14.03	34-18.44	106-53.51	3.64	0.39	17	03	095	0.10	000.3	000.9	b a b
80126	1213 39.96	34-18.51	106-53.01	0.90	0.53	10	03	119	0.08	000.4	002.2	b b b
80126	1507 31.69	34-18.07	106-53.23	1.11	0.39	13	04	098	0.09	000.4	002.9	b b b
80128	0314 08.47	34-18.15	106-53.62	2.49	0.46	10	04	119	0.15	000.7	001.9	b a b
80128	0736 32.22	34-18.29	106-53.31	1.88	0.86	19	04	099	0.14	000.5	001.7	b a b
80128	0756 22.69	34-18.38	106-53.00	3.14	0.47	19	04	107	0.14	000.5	001.2	b a b
80128	1939 16.74	34-18.32	106-53.85	4.24	0.06	15	03	086	0.15	000.5	001.1	a a a
80202	1607 58.10	34-14.91	106-52.61	3.75	0.12	17	10	082	0.15	000.4	002.1	b b b
80204	0914 32.73	34-17.79	106-49.97	7.37	0.36	19	07	111	0.15	000.5	001.4	b a b
80204	0924 14.48	34-17.28	106-49.30	4.20	0.21	21	09	108	0.13	000.4	001.5	b a b
80207	2246 09.83	34-16.09	106-54.38	2.00	0.75	11	08	096	0.12	000.5	002.9	b b b
80210	1152 34.10	34-18.05	106-53.49	4.01	0.57	10	04	120	0.10	000.5	001.0	b a b
80215	1630 03.92	34-18.39	106-53.85	4.25	0.73	10	03	086	0.07	000.4	000.6	a a a
80216	0736 11.42	34-18.30	106-53.85	4.72	0.48	14	04	085	0.11	000.4	000.8	a a a
80218	0128 28.35	34-18.70	106-52.99	4.22	0.21	13	03	113	0.07	000.3	000.7	b a b
80221	1014 13.75	34-19.36	106-53.85	7.00	0.11	18	02	087	0.14	000.5	000.7	a a a
80221	1704 28.95	34-18.24	106-53.58	0.56	0.02	14	04	092	0.13	000.5	005.4	c c b
80222	1402 33.87	34-18.70	106-53.85	3.51	0.69	12	03	100	0.09	000.4	000.9	b a b

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80302 0810 52.88 34-21.85 106-59.01  7.50  0.08 12 09 174 0.16001.0001.5 c b c
80304 1059 06.09 34-18.03 106-53.57  0.56  0.49 14 04 106 0.17001.2010.6 c c b
80305 0458 47.67 34-21.27 106-47.85  9.95  0.55 10 09 188 0.14001.0001.3 c b d
80305 1825 47.33 34-16.19 106-51.44  4.51  0.56 11 08 109 0.10000.5002.3 b b b
80306 0715 58.56 34-19.46 106-53.17  6.10  0.76 09 02 127 0.14001.2001.1 b b b
80312 1826 11.32 34-17.34 106-54.97  4.42  0.63 07 06 180 0.07001.3001.8 c b c
80313 0102 46.96 34-19.13 106-52.92  7.00  0.29 17 02 115 0.15000.5000.8 b a b
80402 0029 50.67 34-18.12 106-53.72  3.22  0.35 11 04 088 0.1 000.5001.2 a a a
80408 0745 17.90 34-16.34 106-53.09  2.58  0.07 11 07 112 0.08000.5002.5 b b b
80410 0226 35.67 34-17.94 106-48.89  7.38  0.46 10 09 146 0.13000.8001.9 b a c
80422 1650 13.72 34-17.72 106-49.33  7.64  0.96 16 08 111 0.16000.6001.7 b b b
80426 1738 43.24 34-20.29 106-52.55  4.49  0.24 11 02 171 0.14001.0000.8 b a c
80508 1159 45.86 34-18.39 106-48.43  0.81  1.03 13 09 116 0.10000.4001.0 b a b
80510 1122 50.00 34-16.99 106-49.41  5.05  0.12 12 09 128 0.11000.6001.7 b a b
80516 0019 02.80 34-19.20 106-52.15  6.16  0.03 14 03 145 0.15000.6001.0 b a c
80531 0459 03.51 34-19.02 106-52.64  5.14  0.05 15 03 115 0.15000.5000.9 b a b
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Precise (HYPO71, ERH < 0.5, and ERZ < 1.0) hypocenters

Precise (HYPO71, ERH ≤ 0.5, and ERZ ≤ 1.0) hypocenters

DATE	TIME	LATITUDE	LONGITUDE	DEPTH KM.	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY
820824	0758 36.00	34-17.37	106-53.09	13.74	01.13	06	23	121	0.02	00.2	00.9	b a b
830303	1119 00.05	34-18.29	106-52.10	07.00	01.67	10	02	112	0.08	00.5	00.6	b a b
830303	1607 00.04	34-18.08	106-51.78	07.57	01.00	10	02	106	0.07	00.5	00.6	b a b
830303	1740 00.05	34-18.59	106-52.01	07.41	01.92	11	02	109	0.05	00.3	00.4	b a b
830303	2235 00.02	34-17.92	106-52.58	04.51	01.02	11	01	094	0.05	00.3	00.4	b a b
830304	0000 00.02	34-18.29	106-52.54	05.35	01.99	13	01	067	0.10	00.5	00.6	a a a
830304	0147 00.00	34-17.93	106-52.33	04.61	01.87	12	01	067	0.06	00.3	00.5	a a a
830304	0149 00.01	34-18.14	106-52.52	06.55	01.30	12	01	066	0.04	00.2	00.3	a a a
830304	0326 00.05	34-19.08	106-52.34	07.25	00.73	10	02	078	0.04	00.2	00.3	a a a
830304	0525 59.99	34-18.08	106-52.67	06.54	01.90	12	01	064	0.05	00.3	00.3	a a a
830304	1353 00.02	34-18.56	106-52.67	05.45	00.57	09	01	126	0.04	00.3	00.4	b a b
830304	1819 59.94	34-17.67	106-52.35	05.32	01.10	12	02	065	0.08	00.4	00.6	a a a
830304	2148 59.99	34-18.59	106-52.52	05.90	00.84	10	01	070	0.08	00.5	00.7	a a a
830306	0010 60.00	34-18.29	106-52.00	07.46	00.96	10	02	074	0.04	00.3	00.4	a a a
830306	0259 60.00	34-17.95	106-51.93	07.00	00.51	10	02	072	0.05	00.3	00.5	a a a
830306	2213 00.07	34-17.65	106-52.94	05.57	00.91	09	01	087	0.05	00.4	00.5	a a a
830306	2326 00.04	34-17.96	106-52.26	04.97	00.60	09	05	099	0.04	00.3	00.6	b a b
830308	0606 00.05	34-18.29	106-52.79	05.79	01.24	11	01	093	0.04	00.2	00.3	b a b
830308	0619 00.01	34-18.17	106-52.80	04.48	02.03	12	01	092	0.07	00.4	00.5	b a b
830308	0827 00.13	34-17.37	106-51.80	04.57	01.42	11	03	099	0.05	00.3	00.5	b a b
830308	1604 00.04	34-19.07	106-51.60	05.92	00.90	10	03	123	0.06	00.4	00.5	b a b
830309	0904 60.00	34-18.10	106-52.74	05.43	01.69	11	01	095	0.05	00.3	00.4	b a b
830309	1503 00.00	34-18.29	106-52.58	05.75	00.84	09	01	098	0.05	00.3	00.4	b a b
830309	2303 00.02	34-18.29	106-52.72	05.30	00.72	10	01	097	0.05	00.3	00.4	b a b
830309	2325 00.01	34-18.05	106-52.78	05.16	01.24	11	01	095	0.04	00.2	00.3	b a b
830311	1107 00.03	34-17.41	106-52.29	04.56	00.63	08	02	106	0.06	00.5	00.7	b a b
860111	0158 02.63	34-16.38	106-54.57	06.11	00.31	14	07	070	0.10	00.3	00.9	b a b
860112	2224 43.60	34-18.69	106-53.32	04.58	00.09	09	03	103	0.08	00.4	00.9	b a b
860127	1307 42.27	34-14.36	106-48.61	10.63	-0.11	11	17	123	0.08	00.3	01.0	b a b
860523	2308 32.80	34-18.68	106-54.70	03.91	00.67	11	03	092	0.04	00.2	00.5	b a b
860601	2047 56.70	34-18.97	106-54.71	07.00	00.09	09	03	099	0.07	00.4	00.9	b a b
870419	2336 53.17	34-17.79	106-51.34	04.63	00.37	09	06	125	0.05	00.2	00.9	b a b
871202	0418 41.92	34-19.62	106-48.45	09.13	00.40	13	08	125	0.09	00.4	00.9	b a b
880117	1501 09.68	34-18.21	106-53.11	06.22	00.11	09	04	103	0.08	00.4	00.8	b a b
880120	1903 49.57	34-18.18	106-53.46	03.08	00.05	16	04	094	0.09	00.3	00.8	b a b
880121	1519 26.79	34-18.79	106-53.18	07.00	-0.47	15	03	109	0.14	00.5	00.8	b a b
880126	1005 14.03	34-18.44	106-53.51	03.64	00.39	17	03	095	0.10	00.3	00.9	b a b
880210	1152 34.10	34-18.05	106-53.49	04.01	-0.57	10	04	120	0.10	00.5	01.0	b a b

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880215 1630 03.92 34-18.39 106-53.85 04.25 -0.73 10 03 086 0.07 00.4 00.6 a a a
880216 0736 11.42 34-18.30 106-53.85 04.72 -0.48 14 04 085 0.11 00.4 00.8 a a a
880218 0128 28.35 34-18.70 106-52.99 04.22 -0.21 13 03 113 0.07 00.3 00.7 b a b
880221 1014 13.75 34-19.36 106-53.85 07.00 -0.11 18 02 087 0.14 00.5 00.7 a a a
880222 1402 33.87 34-18.70 106-53.85 03.51 -0.69 12 03 100 0.09 00.4 00.9 b a b
880313 0102 46.96 34-19.13 106-52.92 07.00 00.29 17 02 115 0.15 00.5 00.8 b a b
880508 1159 45.86 34-18.39 106-48.43 10.81 01.03 13 09 116 0.10 00.4 01.0 b a b
880531 0459 03.51 34-19.02 106-52.64 05.14 00.05 15 03 115 0.15 00.5 00.9 b a b
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HYPO71 A quality hypocenters

HYPO71 A Quality Hypocenters

DATE	TIME	LOCATION		DEPTH KM.	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY
		LATITUDE	LONGITUDE									
830304	0000 00.02	34–18.29	106–52.54	05.35	01.99	13	01	067	0.10	000.5	000.6	a a a
830304	0147 00.00	34–17.93	106–52.33	04.61	01.87	12	01	067	0.06	000.3	000.5	a a a
830304	0149 00.01	34–18.14	106–52.52	06.55	01.30	12	01	066	0.04	000.2	000.3	a a a
830304	0326 00.05	34–19.08	106–52.34	07.25	00.73	10	02	078	0.04	000.2	000.3	a a a
830304	0525 59.99	34–18.08	106–52.67	06.54	01.90	12	01	064	0.05	000.3	000.3	a a a
830304	1819 59.94	34–17.67	106–52.35	05.32	01.10	12	02	065	0.08	000.4	000.6	a a a
830304	2148 59.99	34–18.59	106–52.52	05.90	00.84	10	01	070	0.08	000.5	000.7	a a a
830305	1105 00.00	34–17.97	106–51.57	05.93	00.93	10	03	076	0.09	000.6	000.9	a a a
830306	0010 60.00	34–18.29	106–52.00	07.46	00.96	10	02	074	0.04	000.3	000.4	a a a
830306	0259 60.00	34–17.95	106–51.93	07.00	00.51	10	02	072	0.05	000.3	000.5	a a a
830306	2213 00.07	34–17.65	106–52.94	05.57	00.91	09	01	087	0.05	000.4	000.5	a a a
851110	0143 25.95	34–15.12	106–54.47	10.63	–0.16	11	09	075	0.15	000.7	001.5	a a a
860426	1614 35.35	34–16.28	106–53.18	08.44	00.41	10	07	087	0.10	000.4	001.3	a a a
860522	1344 29.54	34–18.72	106–54.28	04.59	00.49	10	03	082	0.11	000.6	001.2	a a a
880117	0514 49.31	34–18.39	106–53.85	03.22	00.90	15	03	086	0.13	000.5	001.5	a a a
880128	1939 16.74	34–18.32	106–53.85	04.24	–0.06	15	03	086	0.15	000.5	001.1	a a a
880215	1630 03.92	34–18.39	106–53.85	04.25	–0.73	10	03	086	0.07	000.4	000.6	a a a
880216	0736 11.42	34–18.30	106–53.85	04.72	–0.48	14	04	085	0.11	000.4	000.8	a a a
880221	1014 13.75	34–19.36	106–53.85	07.00	–0.11	18	02	087	0.14	000.5	000.7	a a a
880402	0029 50.67	34–18.12	106–53.72	03.22	–0.35	11	04	088	0.10	000.5	001.2	a a a

<u>HYPO71 B or better quality hypocenters</u>

| DATE | TIME | LOCATION | | DEPTH | MAG. | NO | DM | GAP | RMS | ERH | ERZ | QUALITY |
		LATITUDE	LONGITUDE	KM.								
820824	0758 36.00	34-17.37	106-53.09	13.74	01.13	06	23	121	0.02	000.2	000.9	b a b
820918	0339 37.57	34-18.08	106-47.99	13.07	01.94	11	15	065	0.24	001.4	004.6	b b b
821017	0601 10.98	34-17.45	106-48.15	11.35	-1.18	06	16	173	0.06	000.4	001.0	b a c
821017	1526 19.06	34-17.96	106-48.46	10.83	-0.83	07	16	178	0.04	000.3	000.9	b a c
821026	0118 20.18	34-16.81	106-48.92	06.94	-0.66	07	17	169	0.02	000.1	000.7	b a c
821103	0922 27.08	34-17.99	106-46.91	15.86	01.13	14	14	063	0.26	001.1	002.9	b b a
821106	1651 11.07	34-21.86	106-54.19	13.60	00.77	16	25	127	0.26	000.9	003.0	b b b
821125	0210 19.99	34-17.73	106-48.06	10.59	-0.14	09	16	117	0.08	000.5	001.3	b a b
821208	2150 26.45	34-16.98	106-49.37	08.46	-0.55	09	18	145	0.08	000.6	001.9	b a c
830212	1407 23.90	34-17.00	106-48.97	07.00	-0.24	09	17	145	0.08	000.3	001.7	b a c
830226	1115 41.05	34-18.57	106-52.41	11.57	03.04	21	22	058	0.23	000.7	002.9	b b b
830303	1119 00.05	34-18.29	106-52.10	07.00	01.67	10	02	112	0.08	000.5	000.6	b a b
830303	1607 00.04	34-18.08	106-51.78	07.57	01.00	10	02	106	0.07	000.5	000.6	b a b
830303	1740 00.05	34-18.59	106-52.01	07.41	01.92	11	02	109	0.05	000.3	000.4	b a b
830303	2235 00.02	34-17.92	106-52.58	04.51	01.02	11	01	094	0.05	000.3	000.4	b a b
830304	0000 00.02	34-18.29	106-52.54	05.35	01.99	13	01	067	0.10	000.5	000.6	a a a
830304	0147 00.00	34-17.93	106-52.33	04.61	01.87	12	01	067	0.06	000.3	000.5	a a a
830304	0149 00.01	34-18.14	106-52.52	06.55	01.30	12	01	066	0.04	000.2	000.3	a a a
830304	0326 00.05	34-19.08	106-52.34	07.25	00.73	10	02	078	0.04	000.2	000.3	a a a
830304	0525 59.99	34-18.08	106-52.67	06.54	01.90	12	01	064	0.05	000.3	000.3	a a a
830304	0526 10.47	34-18.11	106-52.80	09.74	01.78	14	01	061	0.18	000.9	001.2	b b a
830304	1353 00.02	34-18.56	106-52.67	05.45	00.57	09	01	126	0.04	000.3	000.4	b a b
830304	1819 59.94	34-17.67	106-52.35	05.32	01.10	12	02	065	0.08	000.4	000.6	a a a
830304	2148 59.99	34-18.59	106-52.52	05.90	00.84	10	01	070	0.08	000.5	000.7	a a a
830305	1105 00.00	34-17.97	106-51.57	05.93	00.93	10	03	076	0.09	000.6	000.9	a a a
830306	0010 60.00	34-18.29	106-52.00	07.46	00.96	10	02	074	0.04	000.3	000.4	a a a
830306	0259 60.00	34-17.95	106-51.93	07.00	00.51	10	02	072	0.05	000.3	000.5	a a a
830306	2213 00.07	34-17.65	106-52.94	05.57	00.91	09	01	087	0.05	000.4	000.5	a a a
830306	2326 00.04	34-17.96	106-52.26	04.97	00.60	09	05	099	0.04	000.3	000.6	b a b
830308	0606 00.05	34-18.29	106-52.79	05.79	01.24	11	01	093	0.04	000.2	000.3	b a b
830308	0619 00.01	34-18.17	106-52.80	04.48	02.03	12	01	092	0.07	000.4	000.5	b a b
830308	0827 00.13	34-17.37	106-51.80	04.57	01.42	11	03	099	0.05	000.3	000.5	b a b
830308	1604 00.04	34-19.07	106-51.60	05.92	00.90	10	03	123	0.06	000.4	000.5	b a b
830309	0904 60.00	34-18.10	106-52.74	05.43	01.69	11	01	095	0.05	000.3	000.4	b a b
830309	1503 00.00	34-18.29	106-52.58	05.75	00.84	09	01	098	0.05	000.3	000.4	b a b
830309	2303 00.02	34-18.29	106-52.72	05.30	00.72	10	01	097	0.05	000.3	000.4	b a b
830309	2325 00.01	34-18.05	106-52.78	05.16	01.24	11	01	095	0.04	000.2	000.3	b a b
830311	1107 00.03	34-17.41	106-52.29	04.56	00.63	08	02	106	0.06	000.5	000.7	b a b

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830311 1146 00.02 34-19.05 106-52.03 06.09 00.61 08 02 110 0.08000.7001.0 b a b
830317 2235 52.14 34-18.15 106-53.13 12.77 02.99 08 23 110 0.09000.6002.3 b b b
830319 1157 20.98 34-19.32 106-52.71 22.07 -0.18 07 23 162 0.10000.9001.7 b a c
830323 2211 22.71 34-16.37 106-53.79 12.15 00.25 08 25 145 0.08000.6002.0 b a c
830325 1906 04.25 34-18.33 106-51.51 17.89 00.23 09 21 155 0.10000.7001.5 b a c
830326 0210 47.04 34-17.39 106-53.48 18.65 00.21 06 24 145 0.03000.4000.9 b a c
830411 1435 11.55 34-16.62 106-50.56 11.91 00.19 09 20 103 0.06000.4001.1 b a b
830422 0917 01.35 34-17.81 106-52.27 09.35 -0.16 07 22 150 0.02000.3000.9 b a c
830428 2229 26.38 34-16.34 106-53.39 10.87 00.16 11 13 137 0.13000.7001.4 b a c
830523 1121 38.33 34-17.90 106-52.20 09.32 -0.17 11 16 151 0.11000.5001.3 b a c
830604 0722 50.49 34-16.37 106-49.30 10.98 -0.34 10 18 139 0.06000.4001.2 b a c
830701 0640 11.71 34-13.90 106-51.56 14.15 -0.04 11 20 120 0.20000.9003.2 b b b
830913 0228 09.01 34-17.11 106-51.75 10.99 00.11 12 21 145 0.09000.4001.3 b a c
831106 1926 17.03 34-20.10 106-49.29 14.22 -0.16 13 17 174 0.15000.7001.5 b a c
840126 0823 09.77 34-17.01 106-54.02 11.91 -0.02 10 24 142 0.12000.6001.9 b a c
840418 0956 47.92 34-14.06 106-54.05 12.08 -0.02 12 18 120 0.21000.8002.7 b b b
840425 0942 20.14 34-15.10 106-53.43 18.80 -0.18 11 21 128 0.20001.0002.1 b b b
840811 1458 16.45 34-19.88 106-49.67 16.55 -0.49 09 18 171 0.11000.8001.5 b a c
840811 1502 16.37 34-19.63 106-49.02 20.20 -0.52 07 17 170 0.07000.7001.2 b a c
840826 0219 54.23 34-18.87 106-48.44 16.87 02.49 12 16 066 0.17000.9002.8 b b a
840826 0714 51.37 34-18.26 106-48.08 12.04 00.07 08 15 116 0.20001.1003.1 b b b
840919 0327 04.74 37-19.05 106-49.95 07.55 00.06 11 06 163 0.10000.6000.8 b a c
841105 0845 59.92 34-18.59 106-48.24 12.82 02.10 09 09 118 0.16001.100.23 b b b
841105 1300 10.74 34-18.65 106-48.89 11.38 01.76 09 08 118 0.15001.1002.3 b b b
841206 0527 21.02 34-16.98 106-52.99 07.85 00.06 11 06 093 0.14000.8001.9 b a b
841215 0001 31.45 34-18.03 106-51.29 08.04 00.50 16 05 111 0.13000.4001.2 b a b
841217 0615 40.03 34-15.13 106-49.88 09.56 00.14 14 11 102 0.17000.6001.7 b b b
850110 0730 17.13 34-14.35 106-54.53 11.27 -0.02 11 11 066 0.25001.0003.4 b b a
850111 0006 03.97 34-15.57 106-53.85 11.02 00.75 12 09 075 0.19000.8002.1 b b a
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850205 0245 22.35 34-15.59 106-53.27 10.64 00.62 12 09 081 0.14000.7002.1 b b a
850205 0449 31.53 34-15.67 106-53.02 11.03 00.95 14 08 084 0.20000.8002.6 b b a
850303 2121 46.13 34-14.26 106-50.47 14.51 00.35 06 21 123 0.10000.9003.0 b b b
850320 2048 09.22 34-19.03 106-52.37 06.33 00.28 10 03 136 0.09000.5000.9 b a c
850327 1949 28.04 34-15.89 106-53.16 09.92 00.61 08 08 145 0.07000.5001.2 b a c
850408 1245 15.93 34-18.39 106-52.52 11.97 00.15 12 04 118 0.14000.7001.5 b a b
850409 0559 24.44 34-14.83 106-53.18 08.47 00.54 10 10 078 0.09000.4001.5 b a b
850410 0729 35.59 34-14.48 106-50.79 07.00 00.12 11 11 094 0.15000.7002.3 b b b
850418 0607 01.83 34-14.24 106-51.28 07.00 -0.05 07 12 096 0.09000.7003.2 b b b
850418 1057 37.25 34-17.39 106-51.28 16.03 00.86 15 06 119 0.27000.7001.8 b b b
850419 0347 15.93 34-15.56 106-53.57 05.35 00.02 09 09 094 0.17001.0003.9 b b b
850420 0819 14.00 34-14.88 106-52.28 07.00 00.45 06 10 136 0.05000.6001.8 b a c
850423 1010 39.05 34-20.29 106-51.10 05.92 00.39 10 04 173 0.14000.9001.6 b a c
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850425 1611 18.84 34-15.80 106-53.13 06.02 01.03 11 08 083 0.20000.8004.3 b b b
850429 0540 57.36 34-18.03 106-53.38 10.37 00.49 13 04 095 0.19000.8001.3 b b b
850517 1148 58.73 34-14.76 106-52.75 07.00 00.24 11 10 096 0.22001.0004.2 b b b
850517 1812 52.07 34-15.32 106-52.57 10.32 00.32 08 09 094 0.13000.9002.6 b b b
850524 0621 38.77 34-15.25 106-52.16 10.64 -0.03 07 09 093 0.04000.5001.2 b a b
850524 0817 57.95 34-14.45 106-52.76 07.00 -0.21 07 11 140 0.04000.4001.5 b a c
850612 1317 52.03 34-17.63 106-53.73 05.76 -0.10 07 05 120 0.08000.9001.6 b a b
850618 1337 58.58 34-16.31 106-52.68 02.02 -0.61 08 07 128 0.11001.0004.4 b b b
850618 1344 21.88 34-16.42 106-52.69 03.56 -0.38 08 07 127 0.15001.5003.9 b b b
850709 0529 59.70 34-16.79 106-52.05 05.24 -0.17 10 07 103 0.2100.10004.0 b b b
850717 1728 15.24 34-15.95 106-54.44 04.77 00.17 08 08 104 0.05000.3001.3 b a b
850808 0819 14.58 34-15.00 106-52.59 06.64 00.37 11 10 083 0.20000.9002.7 b b b
850808 2157 26.22 34-15.29 106-53.85 09.69 -0.19 08 09 116 0.12000.7001.4 b a b
850811 0626 38.45 34-14.02 106-51.91 07.00 -0.64 08 12 088 0.15000.9003.2 b b b
850816 1106 48.52 34-15.97 106-50.88 05.73 01.32 13 09 099 0.16000.7002.7 b b b
850921 0600 27.08 34-19.03 106-52.10 07.00 00.14 15 19 116 0.11000.4001.7 b a c
850922 1301 20.38 34-18.27 106-51.77 05.44 ***** 13 05 128 0.15000.6001.7 b b b
850923 0211 47.44 34-19.38 106-52.32 07.00 00.33 12 03 149 0.11000.6001.1 b a c
850925 0734 37.36 34-19.16 106-52.14 07.00 00.07 09 03 144 0.12000.7001.4 b a c
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851003 0121 33.82 34-18.43 106-52.92 04.24 00.05 07 03 116 0.14001.4002.4 b b b
851003 1633 17.08 34-17.30 106-49.37 12.60 01.55 14 09 108 0.13000.5001.2 b a b
851018 0616 05.63 34-17.94 106-51.38 05.78 -0.17 10 06 127 0.12000.6001.6 b a b
851023 1916 37.01 34-17.39 106-48.82 09.36 00.17 12 09 137 0.09000.4001.1 b a c
851031 1812 34.99 34-16.64 106-48.90 10.85 00.35 08 10 104 0.09000.8001.5 b a b
851102 1516 18.25 34-17.53 106-48.63 12.59 00.74 14 09 110 0.12000.5001.3 b a b
851102 2002 54.00 34-17.03 106-49.09 11.35 -0.31 08 09 130 0.13000.9002.3 b b b
851110 0143 25.95 34-15.12 106-54.47 10.63 -0.16 11 09 075 0.15000.7001.5 a a a
851120 0343 44.72 34-20.07 106-49.44 08.83 00.13 07 07 173 0.07000.8001.4 b a c
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851201 2237 47.21 34-15.90 106-53.22 07.15 00.30 12 08 083 0.14000.6001.6 b a b
851213 1207 41.95 34-15.61 106-50.88 22.54 00.85 11 10 101 0.21001.2002.2 b b b
851213 1457 13.05 34-14.56 106-51.42 20.00 00.36 10 21 125 0.23001.3003.0 b b b
851214 0138 00.63 34-13.83 106-51.68 14.94 00.71 10 12 103 0.10000.6001.6 b a b
851214 0313 42.55 34-13.90 106-51.98 18.75 00.53 08 12 104 0.10000.8002.0 b a b
851215 0201 13.55 34-17.82 106-54.78 07.00 00.20 09 05 081 0.15001.0002.2 b b a
851228 2009 23.84 34-16.70 106-52.35 07.75 00.16 11 07 098 0.13000.6001.6 b a b
860103 0721 04.85 34-16.43 106-55.01 05.02 00.03 12 07 071 0.14000.5001.5 b a b
860103 1001 44.23 34-16.34 106-54.74 05.70 -0.01 11 07 087 0.15000.6001.4 b a b
860104 0158 07.14 34-16.48 106-54.94 05.53 00.17 09 07 123 0.10000.5001.1 b a b
860109 2331 18.95 34-16.54 106-55.09 07.79 00.24 14 07 067 0.15000.5001.1 b b a
860111 0158 02.63 34-16.38 106-54.57 06.11 00.31 14 07 070 0.10000.3000.9 b a b
860111 0221 48.33 34-16.48 106-55.02 06.20 00.20 14 07 071 0.14000.5001.1 b a b
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860112 2224 43.60 34-18.69 106-53.32 04.58 00.09 09 03 103 0.08000.4000.9 b a b
860127 1307 42.27 34-14.36 106-48.61 10.63 -0.11 11 17 123 0.08000.3001.0 b a b
860131 0612 53.41 34-18.95 106-50.98 09.41 00.18 10 05 153 0.10000.5001.2 b a c
860202 0418 57.57 34-19.58 106-53.48 07.00 00.52 14 01 114 0.20000.8001.5 b b b
860409 0936 17.67 34-14.90 106-53.39 06.31 00.22 11 10 076 0.18000.8002.9 b b b
860411 1229 24.85 34-16.88 106-52.83 07.00 -0.11 11 06 094 0.10000.4001.2 b a b
860412 0401 49.89 34-18.31 106-50.50 07.00 00.66 14 06 114 0.20000.7002.0 b b b
860426 1614 35.35 34-16.28 106-53.18 08.44 00.41 10 07 087 0.10000.4001.3 a a a
860510 1156 11.09 34-17.95 106-51.79 01.88 00.24 10 05 122 0.13000.6003.8 b b b
860510 2241 01.89 34-19.29 106-55.02 05.67 00.86 13 03 116 0.13000.6001.2 b a b
860521 1345 29.92 34-20.31 106-48.01 09.28 00.77 13 09 131 0.15000.6001.5 b a b
860522 1344 29.54 34-18.72 106-54.28 04.59 00.49 10 03 082 0.11000.6001.2 a a a
860523 2308 32.80 34-18.68 106-54.70 03.91 00.67 11 03 092 0.04000.2000.5 b a b
860601 2047 56.70 34-18.97 106-54.71 07.00 00.09 09 03 099 0.07000.4000.9 b a b
860820 1003 57.51 34-17.92 106-51.09 04.60 00.06 11 06 130 0.10000.5001.6 b a b
860901 0756 29.23 34-15.27 106-48.05 10.30 -0.65 08 17 129 0.08000.5001.6 b a b
860921 1216 32.97 34-18.31 106-48.95 05.88 00.08 09 08 152 0.06000.3001.4 b a c
860926 1804 08.81 34-18.48 106-52.27 02.80 00.34 08 04 124 0.07000.5001.6 b a b
861007 2337 31.40 34-19.56 106-54.38 00.73 00.25 10 02 108 0.15000.8003.1 b b b
861014 0756 40.34 34-16.55 106-53.19 04.20 -0.30 08 07 133 0.08000.5001.6 b a b
861019 0640 34.97 34-20.29 106-49.52 06.71 -0.55 10 06 175 0.13000.7001.7 b a c
861022 2343 49.54 34-15.06 106-54.98 07.00 00.17 10 10 095 0.08000.4001.4 b a b
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870113 1211 18.06 34-16.20 106-53.12 03.70 -0.38 08 07 094 0.12000.7003.5 b b b
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870725 0106 34.80 34-17.14 106-53.06 00.94 01.96 09 06 093 0.07000.4004.3 b b b
870725 0252 12.31 34-17.21 106-52.74 01.11 00.63 12 06 098 0.07000.2002.6 b b b
870725 0932 43.17 34-17.58 106-52.81 02.55 01.10 07 05 101 0.08000.6002.6 b b b
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870725 2053 34.22 34-16.93 106-53.08 01.62 00.09 08 26 091 0.17000.5004.0 b b b
870728 1216 57.33 34-16.79 106-53.14 01.04 00.46 07 06 090 0.07000.4005.0 b b b
870810 2145 50.93 34-17.36 106-53.10 01.16 01.26 08 05 094 0.09000.5004.2 b b b
870818 2359 23.72 34-17.63 106-53.19 03.65 01.32 13 05 095 0.12000.5001.8 b a b
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880117 0514 49.31 34-18.39 106-53.85 03.22 00.90 15 03 086 0.13000.5001.5 a a a
880117 1501 09.68 34-18.21 106-53.11 06.22 00.11 09 04 103 0.08000.4000.8 b a b
880117 1854 19.73 34-17.25 106-53.32 01.13 -0.16 09 05 109 0.09000.4002.7 b b b
880119 0159 18.92 34-18.19 106-53.44 00.65 00.04 17 04 095 0.10000.2003.2 b b b
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880123 0947 06.29 34-18.01 106-53.41 00.70 -0.42 13 04 094 0.09000.2002.5 b b b
880125 0546 13.90 34-18.56 106-53.32 03.75 -0.67 09 03 101 0.15000.8001.8 b a b
880126 1005 14.03 34-18.44 106-53.51 03.64 00.39 17 03 095 0.10000.3000.9 b a b
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880126 1507 31.69 34-18.07 106-53.23 01.11 -0.39 13 04 098 0.09000.4002.9 b b b
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880128 0314 08.47 34-18.15 106-53.62 02.49 -0.46 10 04 119 0.15000.7001.9 b a b
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880128 0756 22.69 34-18.38 106-53.00 03.14 00.47 19 04 107 0.14000.5001.2 b a b
880128 1939 16.74 34-18.32 106-53.85 04.24 -0.06 15 03 086 0.15000.5001.1 a a a
880202 1607 58.10 34-14.91 106-52.61 03.75 00.12 17 10 082 0.15000.4002.1 b b b
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880204 0924 14.48 34-17.28 106-49.30 04.20 00.21 21 09 108 0.13000.4001.5 b a b
880207 2246 09.83 34-16.09 106-54.38 02.00 -0.75 11 08 096 0.12000.5002.9 b b b
880210 1152 34.10 34-18.05 106-53.49 04.01 -0.57 10 04 120 0.10000.5001.0 b a b
880215 1630 03.92 34-18.39 106-53.85 04.25 -0.73 10 03 086 0.07000.4000.6 a a a
880216 0736 11.42 34-18.30 106-53.85 04.72 -0.48 14 04 085 0.11000.4000.8 a a a
880218 0128 28.35 34-18.70 106-52.99 04.22 -0.21 13 03 113 0.07000.3000.7 b a b
880221 1014 13.75 34-19.36 106-53.85 07.00 -0.11 18 02 087 0.14000.5000.7 a a a
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880305 1825 47.33 34-16.19 106-51.44 04.51 -0.56 11 08 109 0.10000.5002.3 b b b
880306 0715 58.56 34-19.46 106-53.17 06.10 -0.76 09 02 127 0.14001.2001.1 b b b
880313 0102 46.96 34-19.13 106-52.92 07.00 00.29 17 02 115 0.15000.5000.8 b a b
880402 0029 50.67 34-18.12 106-53.72 03.22 -0.35 11 04 088 0.1 000.5001.2 a a a
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880410 0226 35.67 34-17.94 106-48.89 07.38 -0.46 10 09 146 0.13000.8001.9 b a c
880422 1650 13.72 34-17.72 106-49.33 07.64 00.96 16 08 111 0.16000.6001.7 b b b
880426 1738 43.24 34-20.29 106-52.55 04.49 -0.24 11 02 171 0.14001.0000.8 b a c
880508 1159 45.86 34-18.39 106-48.43 10.81 01.03 13 09 116 0.10000.4001.0 b a b
880510 1122 50.00 34-16.99 106-49.41 05.05 00.12 12 09 128 0.11000.6001.7 b a b
880516 0019 02.80 34-19.20 106-52.15 06.16 00.03 14 03 145 0.15000.6001.0 b a c
880531 0459 03.51 34-19.02 106-52.64 05.14 00.05 15 03 115 0.15000.5000.9 b a b
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Anomalous Fault Plane Solution hypocenters (Jarpe, 1984)

Anomalous Fault Plane Solution Hypocenters (Jarpe, 1984)

DATE	TIME	LOCATION		DEPTH	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY		
		LATITUDE	LONGITUDE	KM.										
830226	1115 41.05	34–18.57	106–52.41	11.57	03.04	21	22	058	0.23	000.7	002.9	b	b	b
830303	2235 00.02	34–17.92	106–52.58	04.51	01.02	11	01	094	0.05	000.3	000.4	b	a	b
830304	0000 00.02	34–18.29	106–52.54	05.35	01.99	13	01	067	0.10	000.5	000.6	a	a	a
830304	0147 00.00	34–17.93	106–52.33	04.61	01.87	12	01	067	0.06	000.3	000.5	a	a	a
830304	0149 00.01	34–18.14	106–52.52	06.55	01.30	12	01	066	0.04	000.2	000.3	a	a	a
830304	0526 10.47	34–18.11	106–52.80	09.74	01.78	14	01	061	0.18	000.9	001.2	b	b	a
830304	1819 59.94	34–17.67	106–52.35	05.32	01.10	12	02	065	0.08	000.4	000.6	a	a	a
830308	0606 00.05	34–18.29	106–52.79	05.79	01.24	11	01	093	0.04	000.2	000.3	b	a	b
830308	0619 00.01	34–18.17	106–52.80	04.48	02.03	12	01	092	0.07	000.4	000.5	b	a	b
830309	0904 60.00	34–18.10	106–52.74	05.43	01.69	11	01	095	0.05	000.3	000.4	b	a	b
830309	2325 00.01	34–18.05	106–52.78	05.16	01.24	11	01	095	0.04	000.2	000.3	b	a	b
830311	1107 00.03	34–17.41	106–52.29	04.56	00.63	08	02	106	0.06	000.5	000.7	b	a	b
830311	1146 00.02	34–19.05	106–52.03	06.09	00.61	08	02	110	0.08	000.7	001.0	b	a	b

Hypocenters for events with Magnitudes > 1.0

Hypocenters for events with Magnitude ≥ 1.0

DATE	TIME	LOCATION LATITUDE	LONGITUDE	DEPTH KM.	MAG.	NO	DM	GAP	RMS	ERH	ERZ	QUALITY
830302	2322 18.61	34–18.26	106–52.48	20.70	04.20	17	22	056	0.38	001.6	004.2	c c b
830226	1115 41.05	34–18.57	106–52.41	11.57	03.04	21	22	058	0.23	000.7	002.9	b b b
830317	2235 52.14	34–18.15	106–53.13	12.77	02.99	08	23	110	0.09	000.6	002.3	b b b
830315	0927 02.93	34–17.07	106–52.33	01.00	02.60	14	22	105	0.36	001.3	041.6	c c c
840826	0219 54.23	34–18.87	106–48.44	16.87	02.49	12	16	066	0.17	000.9	002.8	b b a
830308	0618 59.72	34–18.59	106–52.82	10.30	02.45	15	23	113	0.20	000.8	003.1	c b c
830225	0257 54.31	34–16.75	106–52.99	13.24	02.44	11	23	103	0.35	001.8	006.1	c c b
821007	1241 25.99	34–18.53	106–48.91	03.73	02.36	12	17	067	0.20	001.0	008.9	c c c
830228	2312 42.07	34–17.89	106–52.80	04.71	02.29	13	23	109	0.11	000.4	003.5	c b c
830309	0905 58.95	34–17.82	106–52.57	09.65	02.27	18	22	109	0.23	000.7	002.6	c b c
830331	1610 08.73	34–18.30	106–52.85	07.00	02.17	08	23	111	0.19	001.2	008.9	c c c
820918	0341 14.63	34–18.14	106–48.92	07.00	02.15	10	17	066	0.21	001.2	006.9	c c c
841105	0845 59.92	34–18.59	106–48.24	12.82	02.10	09	09	118	0.16	001.1	00.23	b b b
830323	0100 32.55	34–16.19	106–52.30	00.48	02.03	12	22	100	0.33	001.4	065.0	c c c
830308	0619 00.01	34–18.17	106–52.80	04.48	02.03	12	01	092	0.07	000.4	000.5	b a b
830304	0000 00.02	34–18.29	106–52.54	05.35	01.99	13	01	067	0.10	000.5	000.6	a a a
870725	0106 34.80	34–17.14	106–53.06	00.94	01.96	09	06	093	0.07	000.4	004.3	b b b
820918	0339 37.57	34–18.08	106–47.99	13.07	01.94	11	15	065	0.24	001.4	004.6	b b b
830303	1740 00.05	34–18.59	106–52.01	07.41	01.92	11	02	109	0.05	000.3	000.4	b a b
830304	0525 59.99	34–18.08	106–52.67	06.54	01.90	12	01	064	0.05	000.3	000.3	a a a
830306	2213 29.85	34–18.87	106–51.22	07.00	01.89	13	20	116	0.93	003.8	021.9	d d c
880114	2303 30.80	34–19.13	106–52.84	04.35	01.89	10	02	154	0.06	000.4	000.6	b a c
830304	0147 00.00	34–17.93	106–52.33	04.61	01.87	12	01	067	0.06	000.3	000.5	a a a
830225	0849 55.51	34–17.03	106–53.83	07.00	01.85	11	24	144	0.28	001.4	007.6	c c c
830309	2325 35.15	34–17.66	106–53.16	01.56	01.84	14	23	107	0.22	000.8	021.0	c c c
861222	0624 18.94	34–16.14	106–55.06	00.86	01.80	11	08	124	0.12	000.6	007.3	c c b
830304	0526 10.47	34–18.11	106–52.80	09.74	01.78	14	01	061	0.18	000.9	001.2	b b a
841105	1300 10.74	34–18.65	106–48.89	11.38	01.76	09	08	118	0.15	001.1	002.3	b b b
861031	1516 29.82	34–21.39	106–48.54	11.18	01.72	12	08	138	0.11	000.6	001.2	b a c
830309	0904 60.00	34–18.10	106–52.74	05.43	01.69	11	01	095	0.05	000.3	000.4	b a b
830303	1119 00.05	34–18.29	106–52.10	07.00	01.67	10	02	112	0.08	000.5	000.6	b a b
861031	1521 35.82	34–21.20	106–48.67	03.63	01.65	11	08	136	0.21	001.1	005.2	c c c
830316	0830 29.28	34–17.80	106–52.13	01.81	01.63	15	22	109	0.37	001.2	024.7	c c c
830228	1349 13.40	34–17.27	106–53.19	01.32	01.56	13	23	105	0.23	000.9	023.7	c c c
851003	1633 17.08	34–17.30	106–49.37	12.60	01.55	14	09	108	0.13	000.5	001.2	b a b
830226	1136 44.35	34–17.74	106–52.41	01.39	01.53	15	22	108	0.32	001.0	027.1	c c c
830226	1553 38.03	34–17.60	106–52.88	01.40	01.47	14	23	107	0.54	001.7	042.8	d d c
830226	1900 42.48	34–18.56	106–52.33	07.00	01.44	11	22	113	0.22	001.0	005.8	c c c

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830308 0827 00.13 34-17.37 106-51.80 04.57 01.42 11 03 099 0.05000.3000.5 b a b
830417 1742 07.78 34-18.32 106-51.83 07.00 01.41 14 21 112 0.20000.7004.3 c b c
861221 0409 19.51 34-16.51 106-54.97 04.33 01.40 14 07 066 0.13000.5002.0 b a b
830414 1323 50.51 34-15.37 106-54.32 11.73 01.37 24 21 054 0.35001.0003.6 c c b
830414 1323 50.83 34-14.97 106-54.99 07.00 01.37 13 20 093 0.13000.5003.1 c b c
830312 2108 16.53 34-17.70 106-52.89 01.04 01.36 13 23 108 0.12000.4009.6 c c c
861013 1216 27.59 34-18.97 106-50.71 00.61 01.35 12 05 155 0.08000.4006.8 c c c
850816 1106 48.52 34-15.97 106-50.88 05.73 01.32 13 09 099 0.16000.7002.7 b b b
870818 2359 23.72 34-17.63 106-53.19 03.65 01.32 13 05 095 0.12000.5001.8 b a b
830304 0149 00.01 34-18.14 106-52.52 06.55 01.30 12 01 066 0.04000.2000.3 a a a
870709 2224 11.56 34-17.11 106-53.49 00.21 01.28 09 06 087 0.09000.6031.0 c c b
870810 2145 50.93 34-17.36 106-53.10 01.16 01.26 08 05 094 0.09000.5004.2 b b b
830417 1134 27.69 34-18.59 106-52.14 07.00 01.25 13 22 113 0.20000.8004.8 c b c
830309 2325 00.01 34-18.05 106-52.78 05.16 01.24 11 01 095 0.04000.2000.3 b a b
830308 0606 00.05 34-18.29 106-52.79 05.79 01.24 11 01 093 0.04000.2000.3 b a b
861222 1629 43.73 34-16.22 106-54.87 00.89 01.21 09 08 124 0.13000.7009.1 c c b
830319 2310 55.17 34-16.32 106-53.12 07.00 01.17 13 23 101 0.23000.9005.3 c c c
820903 2111 33.54 34-22.57 106-52.88 02.09 01.17 07 34 246 0.08000.5007.8 d c d
821103 0922 27.08 34-17.99 106-46.91 15.86 01.13 14 14 063 0.26001.1002.9 b b a
820824 0758 36.00 34-17.37 106-53.09 13.74 01.13 06 23 121 0.02000.2000.9 b a b
830325 1252 20.76 34-20.30 106-52.76 12.20 01.10 12 23 171 0.33001.7004.8 c c c
830304 1819 59.94 34-17.67 106-52.35 05.32 01.10 12 02 065 0.08000.4000.6 a a a
870725 0932 43.17 34-17.58 106-52.81 02.55 01.10 07 05 101 0.08000.6002.6 b b b
861025 0005 37.78 34-17.85 106-54.76 02.99 01.09 15 05 081 0.14000.5002.2 b b a
830311 1046 13.48 34-17.80 106-51.96 10.34 01.09 13 21 109 0.22000.9003.1 c b c
830811 2215 38.98 34-18.87 106-52.68 16.29 01.06 15 22 158 0.33001.4003.5 c c c
830226 1719 43.45 34-18.03 106-53.17 00.30 01.06 13 23 109 0.37001.5446.0 c c c
870726 1312 33.23 34-17.26 106-53.65 00.42 01.06 10 05 085 0.07000.3007.7 c c b
830304 0149 24.31 34-17.27 106-52.41 08.55 01.05 18 02 076 0.38001.3002.1 b c a
830516 0533 16.56 34-17.51 106-48.93 07.00 01.05 15 17 110 0.13000.5002.4 c b c
880508 1159 45.86 34-18.39 106-48.43 10.81 01.03 13 09 116 0.10000.4001.0 b a b
850425 1611 18.84 34-15.80 106-53.13 06.02 01.03 11 08 083 0.20000.8004.3 b b b
830303 2235 00.02 34-17.92 106-52.58 04.51 01.02 11 01 094 0.05000.3000.4 b a b
830303 1607 00.04 34-18.08 106-51.78 07.57 01.00 10 02 106 0.07000.5000.6 b a b
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