U.S. DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY

THE SOUTHERN CALIFORNIA NETWORK BULLETIN JANUARY - DECEMBER 1993

by
Lisa A. Wald
Sue Perry-Huston
and
Douglas D. Given

Open-File Report 94-199

U.S. Geological Survey
525 S. Wilson Avenue
Pasadena, CA 91106

1994

Team of researchers, data analysts, engineers, and assistants involved in the operation of:

SOUTHERN CALIFORNIA SEISMIC NETWORK
SCEC DATA CENTER
TERRASCOPE
CUBE

USGS

Daryl Baisley
Armando Burciaga
Bob Cone
Gary Cone
Bill Curtis
Linda Curtis
Bob Dollar
Doug Given
Tom Heaton
Sue Hough
Ken Hudnut
Donna Jenkins
Lucy Jones
Chuck Koesterer
Scott Lydeen
Jim Mori
Sue Perry
David Wald
Lisa Wald

Caltech

Steve Bryant
Rob Clayton
Katrin Douglass
Janet Fernandes
Ann Freeman
Riley Geary
Egill Hauksson
Will Huston
Kate Hutton
Dave Johnson
Hiroo Kanamori
Phil Maechling
Rosemary Miller
Wayne Miller
Dee Page
Helen Qian
Eric Riggs
Robby Robb
Paul Roberts
Nick Scheckel
Bob Taylor
Debbie Wells
Kathy Willis
Sue Yamada

For questions regarding this Network Bulletin, please contact Lisa Wald at lisa@bombay.gps.caltech.edu (818-405-7822).

Table Of Contents

List of Tables

List of Figures

List of Appendices

Index

INTRODUCTION

The Pasadena Office of the U.S. Geological Survey together with the California Institute of Technology operates a network of more than 300 remote seismometers in southern California called the Southern California Seismic Network (SCSN). Signals from these sites are telemetered to the central processing site at the Caltech Seismological Laboratory in Pasadena. These signals are continuously monitored by computers that detect and record thousands of earthquakes each year. Phase arrival times for these events are picked by analysts and archived along with digital seismograms. Data acquisition, processing and archiving is achieved using the CUSP system. These data are used to compile the Southern California Catalog of Earthquakes, a list beginning in 1932 that currently contains more than 230,000 events. This data set is critical to the evaluation of earthquake hazards in California and to the advancement of geoscience as a whole.

This and previous Network Bulletins are intended to serve several purposes. The most important goal is to make Network data more accessible to current and potential users. It is also important to document the details of Network operation, because only with a full understanding of the process by which the data are produced can researchers use the data responsibly.

NETWORK CONFIGURATION

New Station Locations from GPS

In 1993 Jennifer Scott, currently a post-doc in the Seismology Lab at Caltech, supervised a project to determine accurate locations of all the past and present permanent SCSN stations. The old locations were determined mostly by locating the site on a topo map (NAD-27 system), although some of the recent station locations were determined by hand-held Global Positioning System (GPS).

The new locations include two changes: The locations were determined by using differential GPS positioning from carrier phase measurements, and the latitudes and longitudes are reported in the NAD-83 coordinate system which coincides with the WGS-84 GPS reference frame. Also, the heights are measured relative to the WGS 84 reference ellipsoid rather than sea level (*Scott et al., 1994*). For software that performs conversions between the two systems, contact Lisa Wald. Appendix B is a list of all SCSN stations, past and present, with their new locations. A station list of all SCSN stations past and present can also be found on the SCEC Data Center (scec.gps.caltech.edu) in /export/scec/data1/stations /SCSNstatlist. The format for this file is in the *man* pages.

In addition, Appendix C contains a list of all currently operating stations with their nominal instrument response values needed to compute the gain. The appendix also contains information about calculating the instrument response with the listed values.

New Stations

Several new sites were added in 1993, and many were added after the Northridge earthquake on January 17, 1994. All new stations through February 28, 1994 are included in this list and Table 1. An explanation for the addition of each station is provided, followed by Table 1 which contains information about each station. Figure 1 is a current station map that includes both SCSN and TERRAscope stations.

BAC

A three-component station was installed at Bachelor Mountain to monitor seismic activity in the area around the proposed Domenegoni Reservoir. The equipment belongs to the Department of Water and Power and was installed at this site upon their request.

BAL

This vertical station was added at Balcom Canyon Road after the Northridge earthquake.

BLC

This vertical station was added in Black Canyon after the Northridge earthquake.

GRH

A seven-component network portable station (*Wald et al., 1991*) was moved to Granada Hills after the Northridge earthquake.

HMT

A three-component station was installed in Hemet to monitor seismic activity in the area around the proposed Domenegoni Reservoir. The equipment belongs to the Department of Water and Power and was installed at this site upon their request.

IND

Two horizontal components were added to this pre-existing high-gain vertical site in Indio.

LRL

A high-gain vertical component was added to the already-existing three-component FBA at the Laurel Mountain Radio Facility.

MNT

This vertical station was added in Mint Canyon after the Northridge earthquake.

NHL

A network portable station was installed in Newhall after the Northridge earthquake.

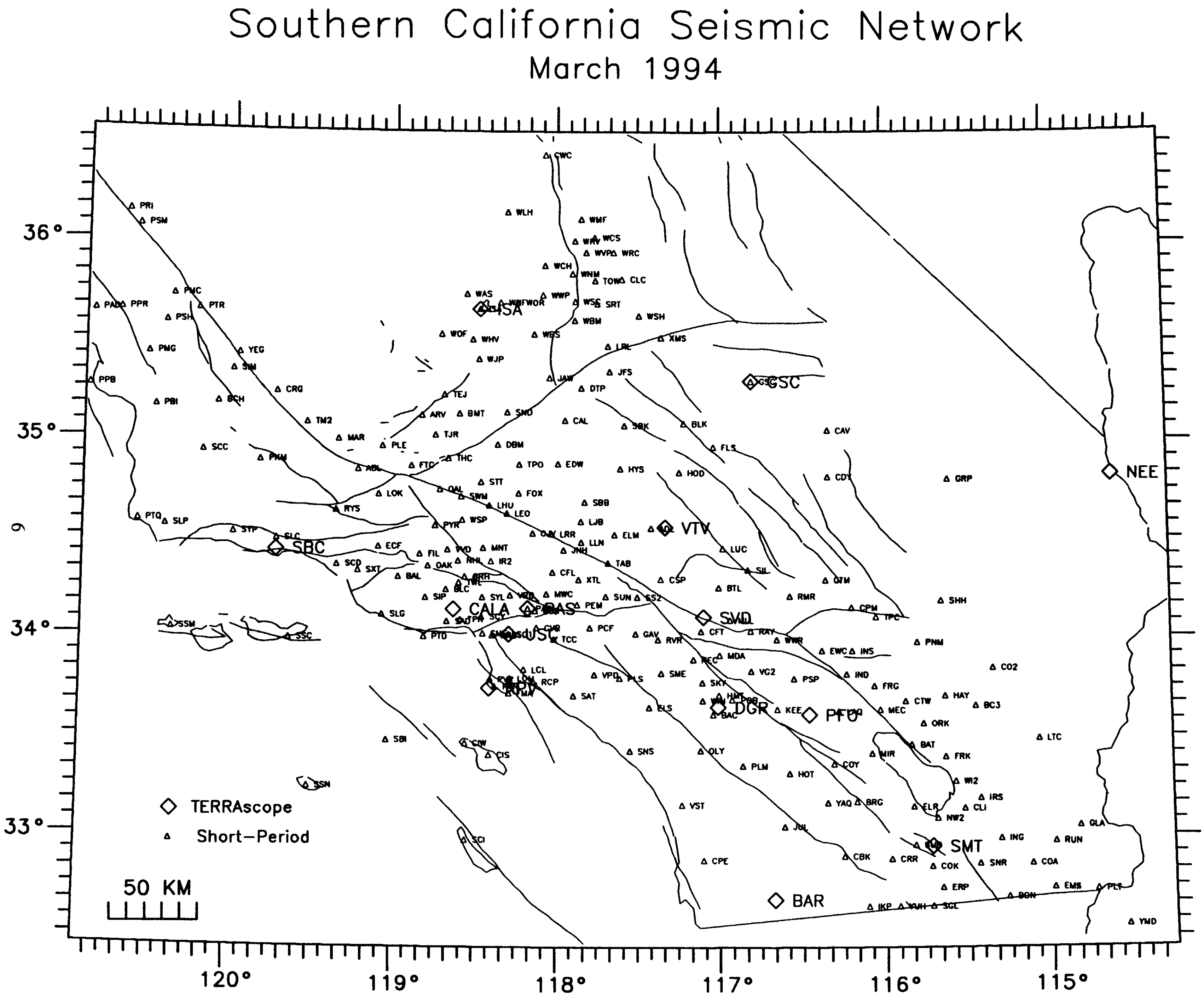

Figure 1. Southern California Seismic Network and TERRAscope. Map of all stations operated and maintained by the Pasadena Field Office as well as several stations operated by other agencies that are also digitally recorded, and TERRAscope stations.

OAK
A three-component station was installed in Oakridge after the Northridge earthquake.

PBI
This Northern California Seismic Network (NCSN) vertical station began to be recorded by our network to better cover events occurring in the northwestern SCSN area.

SIP
Two horizontal components were added to this pre-existing high-gain vertical site at Simi Peak after the Northridge earthquake.

SMF
A network portable station was installed at Santa Monica Field after the Northridge earthquake.

SXT
A vertical station was installed in Sexton Canyon after the Northridge earthquake.

SYL
A network portable station was installed in Sylmar after the Northridge earthquake.

TM2
A vertical station was installed in the Temblor Range after an increase in seismic activity in this area. It is in a slightly different location than the previous TMB site, so it was given a different name.

VRD
A network portable station was installed in Verdugo Hills after the Northridge earthquake.

VVD
A vertical station was installed at Val Verde after the Northridge earthquake.

WIN
A three-component site was installed in at Winchester to monitor seismic activity in the area around the proposed Domenegoni Reservoir. The equipment belongs to the Department of Water and Power and was installed at this site upon their request.

Table 1. New Stations

Code	Site Name	Lat.	Long.	Elev. (m)	Date Installed	Instr.	Orient.
*BAC VHZ	Bachelor Mountain	33.6122° N	117.0406° W	551	12/14/93	L4	vertical high-gain
*BAC VLE	"	"	"	"	"	L4	East low-gain
*BAC VLN	"	"	"	"	"	L4	North low-gain
*BAL VHZ	Balcom Canyon Rd	34.3067° N	118.9673° W	299	02/03/94	L4	vertical high-gain
*BLC VHZ	Black Canyon	34.2433° N	118.6734° W	671	02/01/94	L4	vertical high-gain
*GRH VHZ	Granada Hills	34.3088° N	118.5588° W	748	01/18/94	L4	vertical high-gain
*GRH VLZ	"	"	"	"	"	L4	vertical low-gain
*GRH VLN	"	"	"	"	"	L4	North low-gain
*GRH VLE	"	"	"	"	"	L4	East low-gain
*GRH ASZ	"	"	"	"	"	FBA	vertical
*GRH ASN	"	"	"	"	"	FBA	North
*GRH ASE	"	"	"	"	"	FBA	East
*HMT VHZ		33.71021 °N	117.00414 W°	485	07/13/93	L4	vertical high-gain
*HMT VLN		"	"	"	"	L4	North low-gain
*HMT VLE		"	"	"	"	L4	East low-gain
IND VLN	Indio	33.81673° N	116.23040° W	324	02/05/93	L4	North low-gain
IND VLE	"	"	"	"	"	L4	East low-gain
LRL VHZ	Laurel Mtn Radio Facility	35.47942° N	117.68211° W	1315	04/15/93	L4	vertical high-gain
*MNT VHZ	Mint Canyon	34.4569° N	118.4444° W	701	01/30/94	L4	vertical high-gain
*NHL VHZ	Newhall	34.3918° N	118.5987° W	544	01/20/94	L4	vertical high-gain
*NHL VLZ	"	"	"	"	"	L4	vertical low-gain
*NHL VLN	"	"	"	"	"	L4	North high-gain
*NHL VLE	"	"	"	"	"	L4	East low-gain
*NHL ASZ	"	"	"	"	"	FBA	vertical
*NHL ASN	"	"	"	"	"	FBA	North
*NHL ASE	"	"	"	"	"	FBA	East
*OAK VHZ	Oakridge	34.3640° N	118.7830° W	822	01/22/94	L4	vertical high-gain
*OAK VHN							North high-gain
*OAK VHE							East high-gain
*PBI VHZ	Biddle	35.16131° N	120.47458° W	518	01/07/93	L4	vertical high-gain

Code	Site Name	Lat.	Long.	Elev. (m)	Date Installed	Instr.	Orient.
SIP VLN	Simi Peak	34.20453° N	118.78073° W	700	01/22/94	L4	North high-gain
SIP VLE	"	"	"	"	"	L4	East high-gain
*SMF VHZ	Santa Monica Field	34.0300° N	118.4465° W	14	01/13/94	L4	vertical high-gain
*SMF VLZ	"	"	"	"	"	L4	vertical low-gain
*SMF VLN	"	"	"	"	"	L4	North low-gain
*SMF VLE	"	"	"	"	"	L4	East low-gain
*SMF ASZ	"	"	"	"	"	FBA	vertical
*SMF ASN	"	"	"	"	"	FBA	North
*SMF ASE	"	"	"	"	"	FBA	East
*SXT VHZ	Sexton Canyon	34.3379° N	119.2148° W	488	02/02/94	L4	vertical high-gain
*SYL VHZ	Sylmar	34.2035° N	118.4497° W	1026	01/20/94	L4	vertical high-gain
*SYL VLZ	"	"	"	"	"	L4	vertical low-gain
*SYL VLN	"	"	"	"	"	L4	North low-gain
*SYL VLE	"	"	"	"	"	L4	East low-gain
*SYL ASZ	"	"	"	"	"	FBA	vertical
*SYL ASN	"	"	"	"	"	FBA	North
*SYL ASE	"	"	"	"	"	FBA	East
*TM2 VHZ	Temblor Range	35.08666° N	119.53505° W	902	03/19/93	L4	vertical high-gain
*VRD VHZ	Verdugo Hills	34.2152° N	118.2788° W	902	01/18/94	L4	vertical high-gain
*VRD VLZ	"	"	"	"	"	L4	vertical low-gain
*VRD VLN	"	"	"	"	"	L4	North low-gain
*VRD VLE	"	"	"	"	"	L4	East low-gain
*VRD ASZ	"	"	"	"	"	FBA	vertical
*VRD ASN	"	"	"	"	"	FBA	North
*VRD ASE	"	"	"	"	"	FBA	East
*VVD VHZ	Val Verde	34.4443° N	118.6633° W	625	01/29/94	L4	vertical high-gain
WIN VHZ	Winchester	33.68299° N	117.10366° W	600	08/16/93	L4	vertical high-gain
WIN VLN	"						North low-gain
WIN VLE	"						East low-gain

Note: The * in front of some station codes indicate that the locations for these sites were determined by a topo map or a hand-held GPS. These sites will be located using differential GPS in the future.

Discontinued Stations

Eight stations have been removed since the last Bulletin was released. The removal dates are shown below. The network portable stations BRS (Banning Ranger Station), CCR (Crystal Creek), RMM (Rodman Mountain), and STO (Stoddard Mountain) were moved to new sites after the Northridge earthquake. BRA (Brawley) was removed when the lease was lost on the site. BRT (Bertell Ranch was removed because the Palmdale Airport nearby is undergoing redevelopment. LRM (Laurel Mountain) was moved to a slightly different location and several new components were added (see LRL under *New Stations*). TMB (Temblor Range) was moved to a slightly different location and named TM2 (see *New Stations*). These removals are summarized in Table 2.

Table 2. Discontinued Stations

Station Code	Date Discontinued
BRA	06/29/93
BRS	01/19/94
CCR	01/17/94
LRM	04/15/93
RMM	01/19/94
STO	01/17/94
TMB	03/17/93

TERRAscope Stations

In 1993 five broadband stations were added to the TERRAscope network: DGR at Domenegoni Reservoir, NEE at Needles, RPV at Rancho Palos Verdes, USC at Univ. of Southern California, and VTV at Victorville. CALA, in Calabasas, was added in 1994 after the Northridge earthquake. Figure 1 shows the locations of all the stations. Table 3 below contains the installation dates and locations of all currently operating TERRAscope stations. This table has been updated to include the new locations determined by

GPS (see *New Stations Locations from GPS* in the Network Configuration section). Instrument response parameters can be found on the SCEC Data Center (scec.gps.caltech.edu) in /export/scec/data1 /stations/tersta.dat, and poles and zeroes can be found in tersta.pz.dat in the same directory.

The horizontal components of the ISA (Isabella) station were slightly misaligned during the initial installation and have still not been corrected. They are rotated 20° counter-clockwise from north and east.

All data that are requested from the data logger using the K (kermit) option currently are transferred in the as SEED data of 4096-byte blocks with Steim compression.

Table 3. TERRAscope Site Information

Station	Station Name	Installation Date	Latitude (N)	Longitude (W)	Elevation (meters)	Modem #
BAR	Barrett Dam	10/01/92	32.68005	116.67215	496	619-468-9202
CALA	Calabasas	01/17/94	34.14302	118.62792		818-222-5480
DGR	Domenegoni Reservoir	06/22/93	33.64996	117.00948	609	909-767-0901
GSC	Goldstone	08/08/90	35.30176	116.80572	954	619-386-1408
ISA	Isabella	02/07/91	35.66278	118.47403	817	619-379-8208
MLA(C)	Mammoth	11/04/92	37.63014	118.83611	2134	619-934-6578
NEE	Needles	04/14/93	34.82482	114.59942	139	213-881-8167
PAS	Pasadena	12/87	34.14844	118.17113	257	818-449-9792
PFO	Pinyon Flat	10/31/91	33.61151	116.45935	1245	619-349-3513
RPV	Rancho Palos Verdes	05/12/93	33.74329	118.40426	64	310-377-3676
SBC	Santa Barbara Channel	12/20/90	34.44076	119.71492	61	805-569-1283
SVD	Seven Oaks Dam	12/04/90	34.10645	117.09825	574	714-794-9288
USC	Univ. of Southern California	02/17/93	34.01916	118.28597	17	213-740-8820
VTV	Victorville	04/14/93	34.56058	117.32961	812	213-881-8166

Note: Locations are in NAD-83 coordinate system. All stations have been resurveyed.

Joshua Tree Portables

The following table contains a list of the portable stations that were installed following the Joshua Tree earthquake. The data from these stations will be available through the SCEC Data Center.

Table 4. Joshua Tree Portable Seismometers

Station Code	Station Name	Lat.	Long.	Elev. (m)	Install. Date	Instrument Type
AQUA	Larry Holmgren Ranch	33.932	-116.380	458	04/27/92	L22-3D SCEC v2.45
AQUI	Larry Holmgren Ranch	33.932	-116.380	457	04/27/92	FBA-23
BRCJ	Black Rock Cyn Cmpgrd	34.069	-116.392	1233	04/23/92	FBA-23 L22-3D SCEC v2.45
COVF	Covington Flat	34.030	-116.348	1638	04/28/92	L22-3D Passcal v2.45
DWSR	Desert Water South Res.	33.766	-116.546	162	04/28/92	FBA-23 SCEC v2.45
EDC1	East Deception Canyon	33.917	-116.327	480	04/27/92	L-22 SCEC v2.45
EDCY	East Deception Canyon	33.904	-116.336	377	05/03/92	L-22 Passcal v2.45
EDOM	Edom Hill	33.870	-116.430	454	04/24/92	FBA-23 CMG3-esp SCEC v2.45
HDVL	Valley Vista Rd.				04/23/92	FBA-23 CMG3-ESP CITv2.44
KEYV	Key View	33.926	-116.182	1515	04/27/92	L22-3D Passcal v2.45
LMVR	Little Morongo Vly. Ranch	33.993	-116.524	406	04/23/92	FBA-23 L22-3D SCEC v2.45
SDEC	Smith Desert Country Est.	33.935	-116.404	416	04/23/92	FBA-23 L22-3D Passcal v2.45
UCVF	Upper Covington Flat	34.011	-116.306	1441	04/24/92	FBA-23 L22-3D SCEC v2.45

Note: Locations are in NAD-83 coordinate system. All stations have been resurveyed. The clock for HDVL was not working properly, so most of the data does not have the proper time stamp.

NETWORK OPERATIONS

Status of Processing

The status of each month of the catalog data since the advent of digital recording is described in Table 5. Events for months marked preliminary (**P**) have been timed but have not yet run the gauntlet of quality checking, addition of helicorder amplitudes and rearchiving necessary to become final (**F** with shading). For months marked "pinked" (**PNK**), larger events (~3.0) have only been timed crudely on a few stations and smaller events are absent. A period in 1980-1981 has actually been timed and digital seismograms are available, but the "pinked" version is still used for any purpose requiring good magnitudes or completeness for large earthquakes; some events and magnitudes are missing otherwise. An increased effort has been made in the last couple of years to finalize the backlog of incomplete data . The second half of 1981 and all of 1982 are finalized except for a few missing events. August - December 1983 is also finalized.

Table 5. Processing Status of Network Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1932-1974	PRE-DIGITAL RECORDING - COMPLETE FOR M≥3.0											
1975-1976	ALL PRELIMINARY											
1977	P	P	P	P	P	P	P	P	P	P	P	P
1978	F	F	F	F	F	F	F	F	F	F	F	F
1979	P	P	P	P	P	P	P	P	P	P	P	P
1980	PNK	PNK	PNK	PNK	PNK	PNK	PNK	PNK	PNK	PNK	PNK	PNK
1981	PNK	PNK	P	P	P	P	F	F	F	F	F	F
1982	F	F	F	F	F	F	F	F	F	F	F	F
1983	P	PNK	PNK	PNK	PNK	PNK	PNK	F	F	F	F	F
1984	F	F	F	F	F	F	F	F	F	F	F	F
1985	F	F	F	F	F	F	F	F	F	F	F	F
1986	F	F	F	F	F	F	F	F	F	F	F	F
1987	F	F	F	F	F	F	F	F	F	F	F	F
1988	F	F	F	F	F	F	F	F	F	F	F	F
1989	F	F	F	F	F	F	F	F	F	F	F	F
1990	F	F	F	F	F	F	F	F	F	F	F	F
1991	F	F	F	F	F	F	F	F	F	F	F	F
1992	F	F	F	P	P	P	P	P	P	P	P	P
1993	F	F	F	F	F	F	P	P	P	P	P	P
1994	P	P										

Important Note: The crustal model used in the routine processing of all southern California events, the Hadley-Kanamori model (*Hadley and Kanamori, 1977*), has knowingly been in error since 1977. It has had an incorrect Moho depth of 37 km instead of 32 km. The standard model was changed on February 24, 1993 to correct the Moho depth to 32 km. The effect of the incorrect model was to make the arrival times of the distant stations late, so in the past distant stations were not often used in locations. The model currently being used is shown below.

P-wave velocity (km/sec)	depth to top of layer (m)
5.5	0.0
6.3	5.5
6.7	16.0
7.8	32.0

Real-time Earthquake Data with Finger

You can get recent earthquake information from several seismic networks by using "finger quake@ip-address'. Steve Malone at University of Washington coordinated the effort to make on-line earthquake information available from several networks via the Council of the National Seismic System.

Processed earthquake catalog data for M2.5+ events is now available about 2 minutes after the event occurs by typing:

finger quake@scec.gps.caltech.edu

Earthquake catalog data from the real-time system ISAIAH (not checked by a human) is available by typing:

finger quake@bombay.gps.caltech.edu

The format for the on-line information for each event is as follows:

DATE-(UTC)-TIME LAT LON DEP MAG COMMENTS
yy/mm/dd hh:mm:ss deg. deg. km

ISAIAH Replaces RTP

ISAIAH (Information on Seismic Activity In A Hurry) is a modular real-time automatic earthquake analysis system. It produces phase picks, locations, and magnitudes, within 30 seconds of origin time of local earthquakes. ISAIAH operates on real-time multiplexed digital time series placed in computer memory by the CUSP data acquisition system (*Dollar, 1989*).

ISAIAH consists of three primary real-time modules: PICKLE makes phase picks while the time series are still in computer memory. The picking algorithm uses the "characteristic function" of Allen (1978) and can pick P, S and other phases. FALX associates picks into discrete earthquakes, identifies the phase type and calculates locations using HYPOINVERSE (*Klein, 1989*). MAGNUM calculates windows about the anticipated P-wave and S-wave arrivals times and searches those slices of time series for peak amplitude. It then calculates P and S-wave magnitudes using these amplitudes.

These modules communicate through a structured shared memory section called the PICKLE_BARREL. All data in the PICKLE_BARREL are accessible to any program that links to it. This design allows great flexibility and speed for inserting or extracting real-time phases and locations. For example, using another ISAIAH module (PIPER), phases can be exchanged in real-time via INTERNET between any CUSP networks.

Because it is all software, ISAIAH is flexible and extensible. It requires no new hardware at existing CUSP networks, and it is fast, producing preliminary locations in less then 18 seconds of origin time and final locations and magnitudes in less then 30 seconds, on average. ISAIAH also has tools for testing, review and tuning. ISAIAH is the engine that drives the CUBE system (Caltech USGS Broadcast of Earthquakes). CUBE currently provides near-real-time earthquake information to utilities and transportation organizations in southern California. Real-time notification is becoming increasingly important as the user base grows in size and sophistication. It is also an important step toward an earthquake early warning system (Heaton, 1985).

Data Archiving: Continuous Signal, Regional & Teleseismic Events

As of January 17, 1994 (the day of the Northridge earthquake) the SCSN is no longer routinely copying the triggered digital seismogram data to archive tapes. Instead the data is being copied directly to the mass storage device where it will be available to users immediately via the SCEC_DC (Southern California Earthquake Center Data Center). Backup tapes are also being made while the new archiving system is being fine-tuned.

In addition, all telemetered network data - 330 channels digitized at 100 samples per second - are continuously recorded on 4mm DAT tapes. Three 2-Gbyte tapes are used each day. These tapes provide an on-line system backup and capture signals that do not trigger the local network detection system. The tapes have been useful for recording data that normally would not have been saved, such as teleseismic body and surface waves, and late arrivals from local earthquakes.

All tapes are saved for about one month and then at the end of the month, time periods containing significant earthquakes, important periods of seismicity (such as the Landers earthquake sequence), and other noteworthy events (i.e. space shuttle landings and NTS blasts) are identified and the appropriate tapes are archived. The criteria for saving tapes are given below. Tapes that do not contain significant data are re-used. The archived tapes are boxed and stored chronologically in a cabinet in the SCSN data analysis room at the Caltech Seismological Laboratory.

Tapes are saved if they contain earthquakes meeting any of these broad criteria:

local events	mag >= 4.0
regional events	mag >= 4.5
teleseisms	mag >= 6.0
deep events	>= 100 km, mag >= 5.5
someone has requested the tape be saved.	

A list of events through 1993 that have been saved on 4mm DAT tapes can be found in Appendix D.

To request that a tape be pulled and saved from the last month's batch of recordings, contact Nick Scheckel, 818-395-6955, nick@bombay.gps.caltech.edu.

Instructions on reading the DAT tapes at our facilities can be found in any of the Red Books - the emergency response and important procedures manuals.

For more information about these tapes, contact Sue Perry-Huston at 818-583-7818 or sue@bombay.gps.caltech.edu.

CUSP Meeting

A CUSP meeting was held June 28-29 in Reno, Nevada to discuss current network and project activities, problems, and goals at each of the institutions using CUSP: Hawaiian Volcano Observatory (HVO), Reno, University of Southern California (USC), Eastern Idaho Seismic Network (INEL), USGS at Menlo Park, and USGS at Pasadena. At least one representative from each location was present at the meeting. The following is a brief summary of the discussion that took place at the meeting based on the "Conference Proceedings" prepared by David von Seggern and edited by Charlotte Middlebrooks, both of UNR.

The first part of the meeting consisted of reports from various parties on developments or ideas for developments in real-time earthquake monitoring. Al Lindh (USGS, Menlo Park) suggested that EARTHWORM be used to hold near-real-time data that other computers and processes could then access to work on the data. The move should be made toward a more UNIX-compliant database, perhaps SEED. EARTHWORM, as described by Wil Kohler (USGS, Menlo Park), is a process by which PC's do the phase picking on real-time data gathered by other PC's. Then UNIX programs run association algorithms. The programs involved have very little dependence on PC hardware or software and can be easily ported.

Carl Johnson reported on the AURYN associator. AURYN works on a FIFO buffer of individual picks in shared memory. Hilo, Pasadena, and Menlo Park are currently running AURYN. A recurrent problem is that the associator often divides one large earthquake into several smaller ones. Phil Maechling (Caltech) is working on programming many of the TERRAscope applications. He recommended using the Kanamori energy magnitude for the CUBE system since it is a robust estimater or large magnitudes with TERRAscope data. This currently takes up to 25 minutes after the event to determine. His goal is to reduce the time it takes for getting this magnitude. Doug Given (USGS, Pasadena) reported on several systems under development and testing. CUBE immediately processes real-time picks and triggers e-mail messages and pages to be sent out with event information. ISAIAH is a software system that replaces the hard-coded RTP device. It does phase picking, event location, and magnitude determination. This process usually takes about 30-40 seconds even though it continues making improvements on the event parameters after that time. Single events getting split into more than one event are a problem with this system.

Each network reported on current operations. The SCSN, which normally records about 1,000 events per month, recorded over 6,000 in July 1992 alone after the Landers earthquake. The data processing did not return to a normal schedule until January 1993. TERRAscope M_L's were integrated into the system in early 1993. The NCSN now routinely produces ASCII file of phase picks. They have been using PACKRAT to write continuous data to tape after SQUIRREL was found to be incompatible with their hardware. They have a paging system similar to SCSN's CUBE system with five clients. The UNRSN recorded 10 times the normal seismicity after the Little Skull Mtn. earthquake in June of 1992. They have calibrated the southern network by causing CUSP to trigger and record calibration pulses. The HVOSN is using SQUIRREL to record continuous data. They record unique types of seismic events that the other networks do not, such as collapsing volcanic benches, long-period events, and deep events. They are using TIMIT to analyze events, but think that the biggest problem with the CUSP system is the great number of software modules it takes to run the system. The USCSN operates about 70 channels in the Los Angeles basin. Post-processing is done on Sun computers. Their main problem is the high level of cultural background noise in the recording area. They would benefit from a prefilter option prior to event detection. The INEL operates about 40 seismic channels in eastern Idaho that record about 50-100 events per month. They have no need for real-time information. The CUSP software is currently undergoing DOE Quality Assurance procedures. The Parkfield Networks consist of ten borehole 3-component seismometers about 300 m deep. Reftek data acquisition units at each site record the data which is then collected at a 44D network box and then fed into CUSP using software written by Bob Dollar.

There was a long discussion about magnitudes: which kind to routinely use, which kind to use for real-time information, which kinds to record in the .MEM file. Jim Mori (USGS, Pasadena) said that Wood-Anderson magnitudes, M_L's, are being obtained for events greater than M3.5 by convolving unclipped (low-gain and FBA) records with a Wood-Anderson instrument response. Above M6.0, the Kanamori energy scale, M_W, (*Hanks and Kanamori, 1979*) is preferred since M_L saturates at that magnitude. The consensus was that for the real-time magnitudes, the magnitude has to be calculated from the P wave since that would offer the quickest magnitude determination. The problem with that is that some large earthquakes have a small initial P wave that grows which would tend to result in an underestimation of the magnitude. Many agreed that the moment magnitude, M_O, should be routinely determined. It was suggested that the .MEM files contain more "slots" for a variety of different magnitudes.

Bob Dollar (USGS, Pasadena) said he would like to see more CUSP development going on at individual sites since the CUSP budget is so tight. He sees a need to move to multi-platform development. There was some discussion about a CUSP training session but no resolution on the issue. There was also some discussion about having a central person or committee handle CUSP development requests, with no resolution.

Data exchange was the next topic of discussion. The Southern California Earthquake Center (SCEC) is currently storing 300 Gbytes of data on an optical jukebox. 80% of the archive is CUSP short-period seismograms. There is also some triggered TERRAscope data and the entire SCSN earthquake catalog since 1932. The long-term goal of the SCEC Data Center is to get away from the .MEM and .GRM format. The Berkeley Data Center mostly stores both continuous and triggered data from 20 broad-band stations. They also store many NCSN .MEM and .GRM files which can be converted to SEED or SAC format. Also stored are the NCSN catalog, the UCB catalog, and the NCSN focal mechanisms. They are looking at the IRIS Data Base Management System. There was a consensus among the group that there needs to be more CUSP code management which would include, among other record-keeping, a CUSP version number. The convention for station and component naming is currently being changed in Menlo Park so that data can be merged from all the networks. Bob Dollar has written a program that can merge the .MEM and .GRM files from different networks even if they have different sample rates or bits per sample. Discussion about merging real-time phase picks from different networks indicated that several sites are interested in obtaining real-time data from other sites. Carl Johnson is heading an informal group to determine a format for exchanging raw phase picks via TCP/IP.

Diane DePolo demonstrated the PICKEM program that UNR uses to interactively pick phases and locate events. David von Seggern demonstrated a "quick-look" program that plots the seismograms on the screen with the option to select stations to see from a map. Sam Stewart and Bob

Dollar demonstrated the latest version of TIMIT, the program that NCSN and SCSN used to interactively pick phases and locate events. There are still some bugs that need attention before the latest version will be distributed.

Both NCSN and SCSN are continuously recording the CUSP data streams. SCSN uses a program called SQUIRREL that writes files that can then be read back to create .EVT files that can then be converted to .MEM and .GRM files. There are still a few problems with the process and an increase in the number of network stations with further exacerbate the problems. Allan Walter (USGS, Menlo Park) has split the SQUIRREL program into two parts; one writes the data to a disk for temporary storage while the other part does the actual output to tape.

Version 2.04 of CUSP was distributed in late 1993.

RESEARCH NOTES

Landers: One Year Later

(This is a copy of a report that was written one year after the Landers earthquake to provide information to the media.)

On 28 June 1992 at 4:58am PDT, the Landers earthquake (M_W7.3) ruptured a north-northwest trending, 53-mile-long series of faults in the Mojave desert about 59 miles east of San Bernardino. This earthquake was the largest earthquake in California since the M7.7 Kern County earthquake in 1952. The Landers earthquake sequence is of particular importance to earthquake research since it was relatively well recorded by advanced seismographic systems; this is the largest well recorded earthquake in the U.S. In this brief report, we present some of the conclusions about the earthquake after the first year of data analysis.

The M_W7.3 Landers earthquake was the largest in an extensive sequence of earthquakes in southeastern California last year. The sequence began with a M_W4.6 earthquake on 22 April 1992 located about 10 miles east of Desert Hot Springs in Joshua Tree National Monument. This was followed at 9:50pm by the Joshua Tree earthquake. The Joshua Tree earthquake occurred along a previously unmapped right-lateral strike-slip fault that extended approximately 7 miles northward into the National Monument, although no surface rupture was found. The Joshua Tree earthquake had an extensive aftershock sequence and more than 6,000 aftershocks were recorded on the Southern California Seismographic Network (SCSN) in the following two months.

The Landers earthquake rupture of 28 June 1992 began at the northern end of the Joshua Tree aftershock zone, and the rupture extended northward another 53 miles into the Mojave Desert along a complex series of previously mapped right-lateral, strike-slip faults. These include (from south to north) the Johnson Valley fault, Homestead Valley fault, the Emerson fault, and the Camp Rock fault. The Emerson segment produced the largest surface offset slip of about 21 ft. Along the length of all the faults involved, The average slip was approximately 3-10 ft. Although each of these faults was recognized prior to the earthquake as potentially active, it was quite surprising that all four ruptured during the same earthquake.

Three hours after the Landers earthquake, at 8:04am PDT, the largest aftershock (M_W6.4) occurred on an unmapped fault near Big Bear Lake less than 28 miles away from the Landers mainshock. The Big Bear earthquake produced no ground rupture, but analysis of seismograms leads us to conclude that the earthquake was strike-slip with either left-lateral motion on a northeast-trending fault or right-lateral on a northwest trending plane. The left-lateral northeast-trending plane has been the favored interpretation since aftershocks seem to be aligned in a northeastern direction. However, interpretation of the Big Bear earthquake is still a subject of ongoing research (see below).

The Landers earthquake occurred in an 50 mile-wide, 250 mile-long zone of deformation called the Mojave shear zone. This zone occupies the eastern Mojave desert and accommodates 10-20% of the motion between the Pacific and North American Plates (about two-thirds of the plate motion occurs on the San Andreas system). Northward the plate motions of the Mojave shear zone are transferred onto fault systems in Owens Valley, Panamint Valley, and Death Valley. Previous earthquakes in the area of the Joshua Tree/Landers/Big Bear sequence include the 1948 M_W6.0 Desert Hot Springs earthquake, the 1975 M_W5.0 Galway Lake earthquake, the 1979 M_W5.3 Homestead Valley-Johnson Valley earthquake, and, most recently, the 1986 M_W5.6 North Palm Springs earthquake.

Although earthquake magnitude is commonly assumed to consist of a single, well-defined number that gives the "size" of an earthquake, in reality, seismologists have devised numerous ways to measure earthquake size. The National Earthquake Information Center (NEIC) in Golden, CO, has assigned magnitudes of 7.6 and 6.7 to the Landers and Big Bear earthquakes, respectively, based on the amplitudes of seismic waves measured at large distances. Seismologists refer to this as surface wave magnitude (M_S). However, for the past two decades seismologists have also measured earthquake size in terms of the total energy radiated by an earthquake, and many prefer to describe the size of an earthquake using a somewhat different scale called energy magnitude (M_W). Based on extensive analysis by numerous researchers, the Landers and Big Bear earthquakes have energy magnitudes of 7.3 and 6.4, respectively.

Since the Joshua Tree earthquake in April of 1992, the Southern California Seismographic Network has recorded over 57,000 earthquakes in the entire southern California area (Kate Hutton, Caltech). This is about 40,000 more earthquakes than we normally record in this same interval of time. Of these, more than 26,000 events have been analyzed (i.e., location and magnitude determined)which still leaves many more that are still to be analyzed. However, almost all of the events larger than M3.0 have been analyzed. In the Landers/Big Bear area, there have been 19 earthquakes greater than M5.0, 161 greater than M4.0, and 1,479 greater than M3.0. Although this is a very large number of aftershocks, it is near the worldwide average for an earthquake as large as Landers. Egill Hauksson (Caltech), Lucy Jones (USGS), Kate Hutton (Caltech), and Donna Eberhart-Phillips (USGS) have studied the patterns of aftershock activity and are currently preparing a paper to summarize their findings.

Current probability estimates for aftershocks (Lucy Jones, USGS) indicate that, in the Landers area only, there is a 30% chance of a M5.0 in the next year (June 28, 1993 through June 28, 1994), and a 50% chance over the next three years. Furthermore, we can expect about 45 M3.0 aftershocks in the next year. For comparison, excluding aftershocks, the chance of a M5.0 anywhere in southern California in any one-year period is 80%, and the average rate of M3.0 events is 100 per year.

Since the occurrence of the Landers earthquake, approximately 3,000 earthquakes have occurred in an area just east of Barstow, CA. This activity is 20 miles northwest of the recognized end of the Landers earthquake rupture, and this sequence is spatially separated from other aftershocks. The cause of this activity is unknown, but the rate of earthquake activity is decreasing with time in a manner similar to the other aftershocks.

In an article published in *Science* (*Sieh et al., 1992*), a large research team described the complex surface rupture from the Landers mainshock. Considering the large magnitude of 7.3, the 53-mile observed rupture length was relatively short and the maximum surface offset of 20 ft was relatively large. This feature (short rupture length, large slip) is most commonly observed for faults with relatively low geologic rates of activity (i.e., thousands of years between major earthquakes).

Another large research team reported in *Science* (*Hill, 1993*) that the Landers earthquake triggered seismic activity in numerous locations up to 775 miles from the Landers earthquake. Triggered earthquakes were mostly north of the Landers earthquake and included earthquakes in Ridgecrest (CA), Mammoth Lakes (CA), Mono Basin (CA), Mt. Lassen (CA), Cedar City (UT), the Cascade Mtns., and Yellowstone National Park. A M_W5.6 at Little Skull Mtn. in southern Nevada and a M_W5.7 north of the city of Mojave, CA, were the largest earthquakes triggered at a large distance from the Landers earthquake. Many of the triggered earthquakes occurred in areas of geothermal and recent volcanic activity. The research team suggested two possible triggering mechanisms. In the first, shaking from the Landers earthquake weakened the faults in distant regions, thereby allowing numerous earthquakes to initiate. In the second, ground shaking may have changed the pressure within crustal fluids, thereby triggering earthquakes.

Because the Landers earthquake was the largest California earthquake in recent memory, it provided outstanding data for geodetic studies. The geodetic studies show how surveying monuments were displaced due to the earthquake sequence. Recently developed techniques for measuring surface displacements using the Global Positioning Satellite system (GPS) were of great importance in these studies. Researchers who collected and/or analyzed this data include Ken Hudnut (USGS), Shawn Larson (Lawrence-Livermore), Yehuda Bock (Scripps), Dave Jackson (UCLA), Jeff Freymueller (Stanford), and Mike Lisowski (USGS, Menlo Park). Although monuments within several miles of the rupture moved by up to 10 ft, monuments at distances of more than 25 miles generally moved only several inches. For example, the Jet Propulsion Laboratory in Pasadena moved about half an inch. The nature of slip of the fault can be inferred by studying the amount of motion on this system of monuments. To date, studies of this data indicate that most of the earthquake slip occurred between the earth's surface and a depth of 7 miles. The amount of slip appears to vary significantly with position on the fault plane. Although the largest surface offsets were observed at the north end of the rupture, slip in this region seems to have been confined to a region less than 4 miles deep. Evidence for slip of several inches was found for a fault in the Barstow region which experienced numerous aftershocks since the Landers earthquake. This slip in the Barstow region is comparable in size to that which would normally be expected in a M5.9 earthquake (Ken Hudnut, USGS), although no earthquake of that size has been identified in the Barstow region. Geodetic data can also be used to demonstrate that negligible slip occurred on the San Andreas fault during this earthquake sequence.

David Wald and Tom Heaton (both USGS) have determined a model which shows the detailed history of rupture during the Landers earthquake. The model satisfies all available data sets including geodetic data, records of ground shaking from southern California seismic stations, seismograms recorded world-wide, and observations of slip along the surface trace of the rupture. A color movie of the earthquake slip has been made showing details of how the rupture progressed along the fault surface throughout the 24-second duration of the earthquake. They have determined that the slip occurred in a narrow band (less than 4 miles in length) that traveled along the fault at about 1.7 miles per second (6,000 miles per hour). The fault rupture is compared to sliding a heavy carpet on a floor. The hard way is to slide the entire carpet at the same time, but the easy way is to push a wrinkle in the carpet from one end to the other. This second mechanism seems to be more analogous to the Landers earthquake rupture. The rupture model also infers that there were significant variations in the amount of slip and in the speed of rupture as it spread across the fault surface. These observations provide important information for understanding the basic physics of earthquakes. The model also predicts that the strongest ground shaking occurred in remote parts of the Mojave desert. Furthermore, ground motions were larger at sites to the north than they were for sites to the south at comparable distance. For reference, Pasadena moved back and forth by about 10 inches over a period of 20 seconds during the earthquake.

Sue Hough (USGS), Laura Jones (Caltech), and Don Helmberger (Caltech) have studied ground motions recorded on southern California seismographs for the M6.4 Big Bear earthquake. Their studies suggest that there may have been rupture on a northwest-trending fault in addition to the northeast-trending plane that was inferred from the pattern of aftershock locations. Sue Hough also found evidence to suggest that large aftershocks within several minutes of the Landers earthquake may have occurred on yet another fault, the Eureka Peak fault, which extends southward from the Landers epicenter. These aftershocks may have been the cause of minor surface rupture that was observed on the Eureka Peak fault to the south of the main Landers rupture.

The implications of the Landers earthquake for future earthquake activity was extensively discussed in a report released in December of 1992 entitled "Future seismic hazards in southern California; Implications of the 1992 Landers earthquake sequence." This report is available from the California Division of Mines and Geology, P.O. Box 2980, Sacramento, CA 95812-2980 for $18., and the conclusions of the report are not restated here. However, the additional scientific studies that have occurred since the writing of that report do not appear to significantly affect the conclusions of the report.

The Landers earthquake has provided earth scientists with a tremendous volume of important new data. Analysis and interpretation of this data will almost certainly continue for many years.

SYNOPSIS OF SEISMICITY

A total of 23618 earthquakes and 819 blasts were cataloged for 1993 (Figure 2) at the time of this writing. Of the cataloged events, 238 were greater than or equal to $M_L3.0$ (Appendix A, Figure 3). The largest earthquake within the SCSN network in 1993 had an magnitude of 5.2 and was located in the Wheeler Ridge area near Bakersfield. Focal mechanisms for 9 events ($M_L \geq 4.0$) are shown in Figure 4.

For the following discussion southern California has been divided into eleven sub-regions (Figure 5). These regions are arbitrary, but useful for discussing characteristics of seismicity in a manageable context. Figures 6a and 6b summarize the activity of each sub-region over the past four years. A separate discussion section follows for those regions with notable activity.

Imperial Valley - Region 1

The only activity occurring within the California border in this region was in the Niland/Obsidian Butte area where there was a small swarm in mid-March. Swarms are very common in this area. A number of events M3.0+ that were located just south of the California-Mexico border were also recorded by the network .

South Elsinore - Region 3

On June 22 an M3.6 was located in the Ocotillo Wells area. This is near the southern end of the Elsinore fault.

Los Angeles Coast - Region 5

There was alot of small offshore activity in this region throughout the year. On March 10 an M2.8 was felt just offshore from the Los Angeles airport. The San Pedro Channel experienced quite a few events throughout the year starting with an M2.8 on April 4 near San Pedro that was felt. On July 12 a cluster of seven events occurred between Palos Verdes and Catalina Island. A number of small earthquakes were located between Catalina Island and the site of the 1986 Oceanside earthquake during the period from December 16-20.

Other events in this region include an M3.5 near San Clemente Island on April 7, and an M3.5 off the coast of Malibu that occurred on and east-west striking thrust fault. A series of small M2.0+ earthquakes across the Los Angeles Basin from July 29-August 4 went undetected by the public. Also not felt were four small events (largest M2.3) along the Newport-Englewood fault system near Hollywood Park that all occurred within a 5 minute time period on September 11.

North Elsinore - Region 6

The area just south of Ontario experienced several small quakes that were felt. The first was on February 4, an M2.6, and an M3.1 happened four days later in the same location. Activity continued here through about February 14. On August 4 an M3.3 was felt here also. This site has produced a number of small earthquakes and swarms in the past few years.

Two shallow events, an M2.9 and M2.5, were felt in the Brea and Diamond Bar areas north of the Whittier fault on March 3. The Chino Hills, east of Los Angeles, had a small cluster of events (largest M2.0) on September 30.

San Bernardino - Region 7

Aftershocks of the Landers and Big Bear earthquakes of June 28, 1992 continued as expected throughout the year. There were 13 M3.5+ aftershocks in the Landers area and five M3.0+ aftershocks in the Big Bear area (Figure 4 shows those that were M4.0+; Numbers 2, 5, 6, 7, and 8). The largest Landers aftershock was an M5.0 on August 21 (Figure 4, Number 7) that knocked items off shelves in the epicentral area and was felt as far away as UCLA in Los Angeles. It was located where the aftershock zones of the Landers and Joshua Tree sequences intersect and had an oblique strike-slip and normal mechanism.

The largest Big Bear aftershocks were two M3.8's.The first one, on May 31, was located at the southwest extremity of the Big Bear aftershock zone. The second one, on September 6, was south of Big Bear in the San Bernardino Mountains.

The Redlands area, at the intersection of the Banning and San Jacinto faults, experienced a considerable number of earthquakes of M3.0+ which is common for that area. An M3.0 on March 8 was felt as was an M3.6 11 days later on March 19. In August there was an M3.2 on the 8th and an M2.6 and M3.0 on the 13th. The activity picked up in September when a cluster of 52 events occurred during September 4-8 with the largest being an M3.1. There was more activity in November and December with several small events during December 9-15.

A small cluster of earthquakes was located at the north end of the Salton Sea on May 10 that was of interest due to their proximity to the San Andreas fault, but the activity ended with nothing significant happening. The Cajon Pass was the site of an M3.7 that was widely felt on May 18. The mechanism indicated a thrust fault, therefore it was not on the San Andreas fault. An M3.5 occurred near Eagle Mountain, 17 miles WNW of Desert Center on November 2.

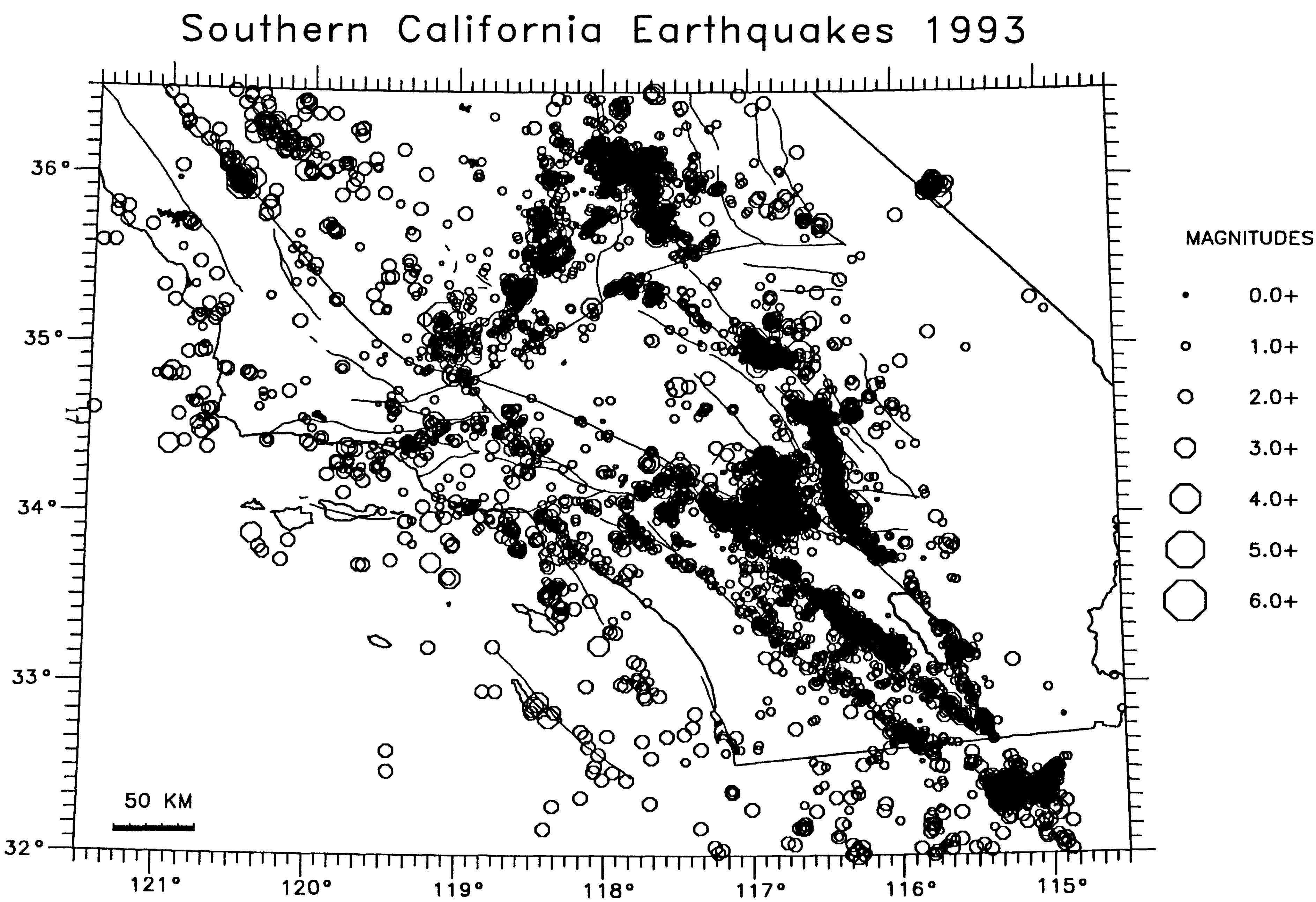

Figure 2. Map of all located earthquakes in southern California for the period of January through December 1993.

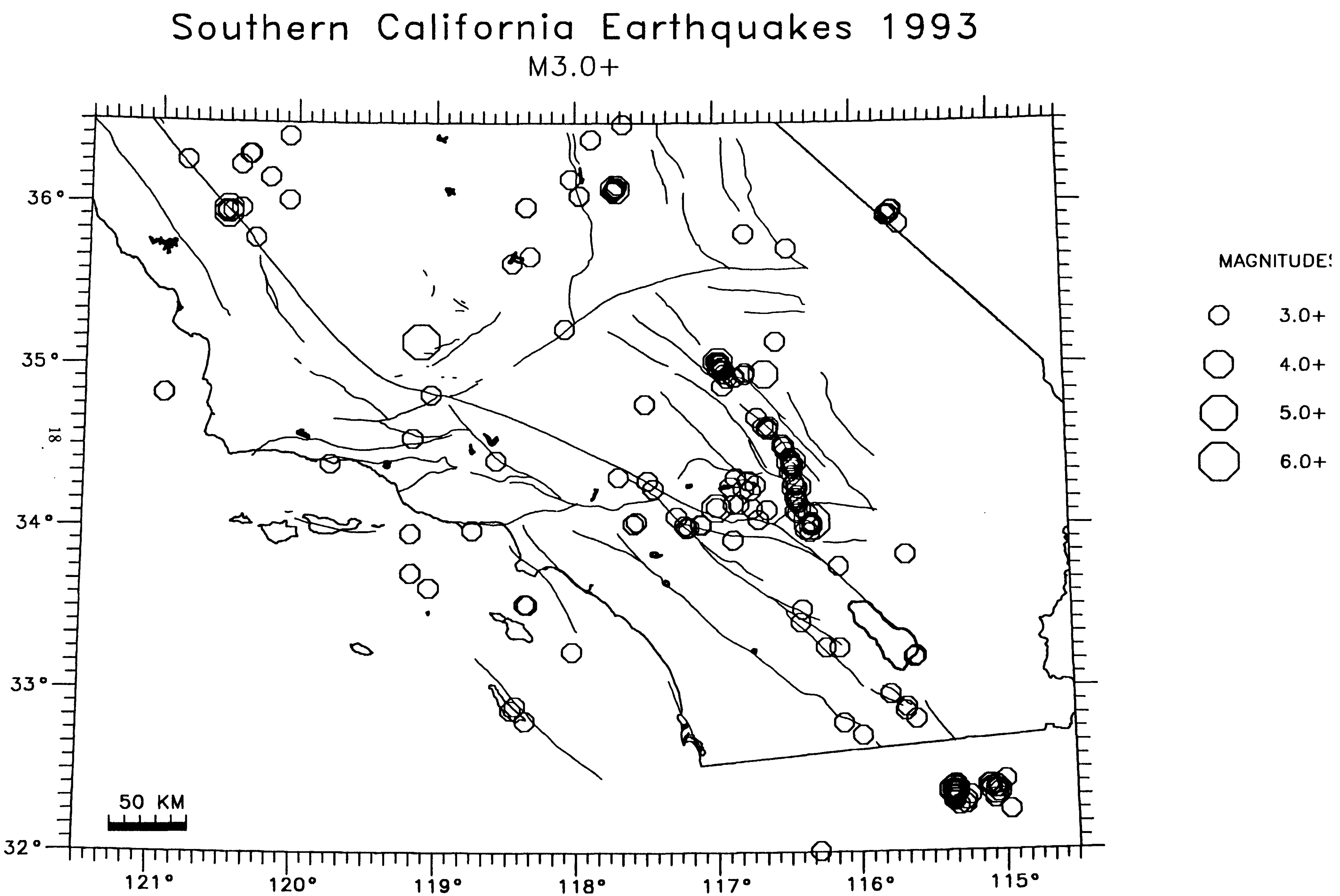

Figure 3. Map of located earthquakes of magnitude 3.0 and larger in southern California for the period of January through December 1993.

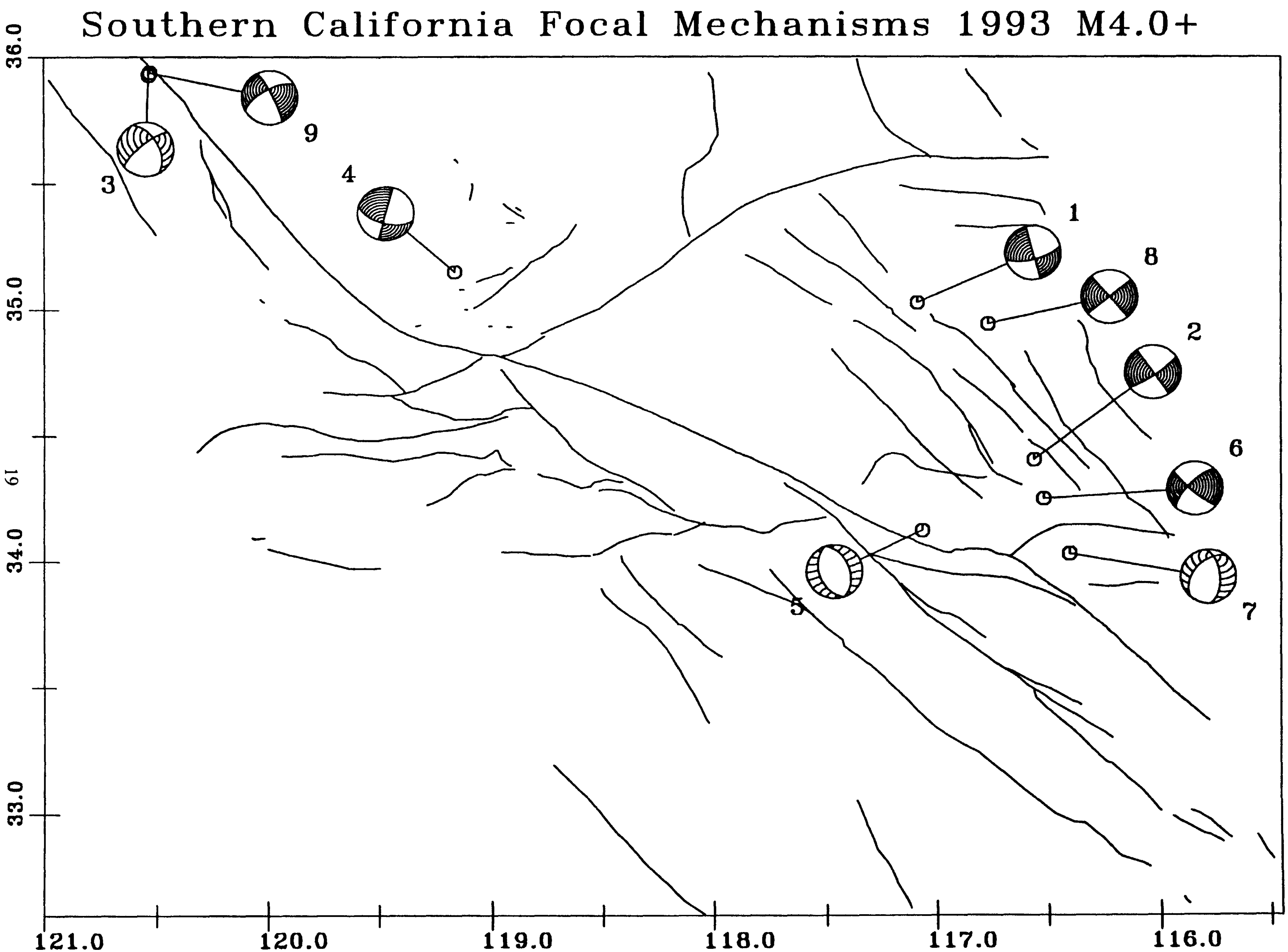

Figure 4. Lower hemisphere focal mechanisms for selected events for the period January through December 1993. Event numbers correspond to numbers in FM column of Appendix A.

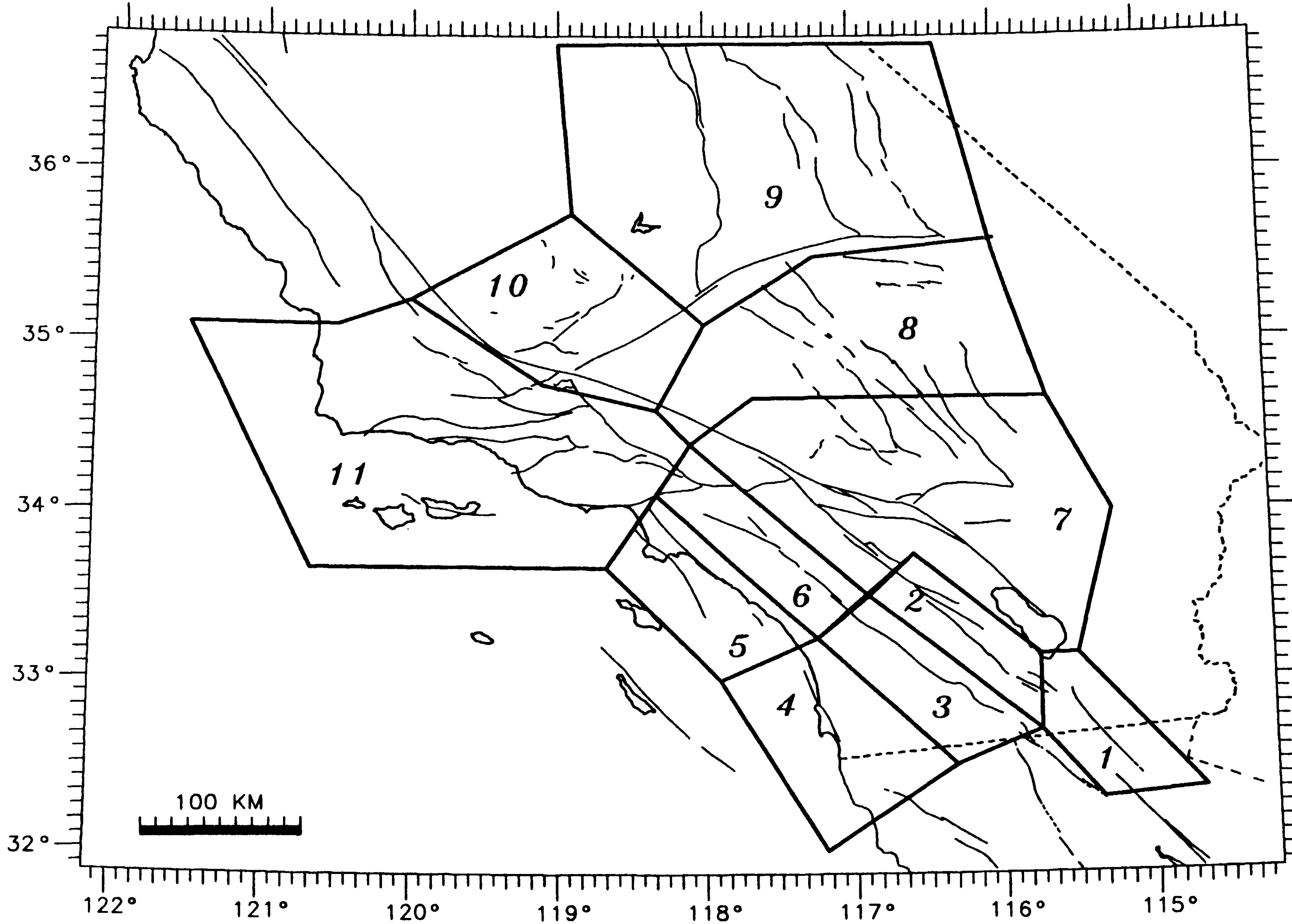

Figure 5. Map of sub-regions used in Figures 6a and 6b. The geographic name of each sub-region, as used in the text, can be found in the headings of Figures 6a and b.

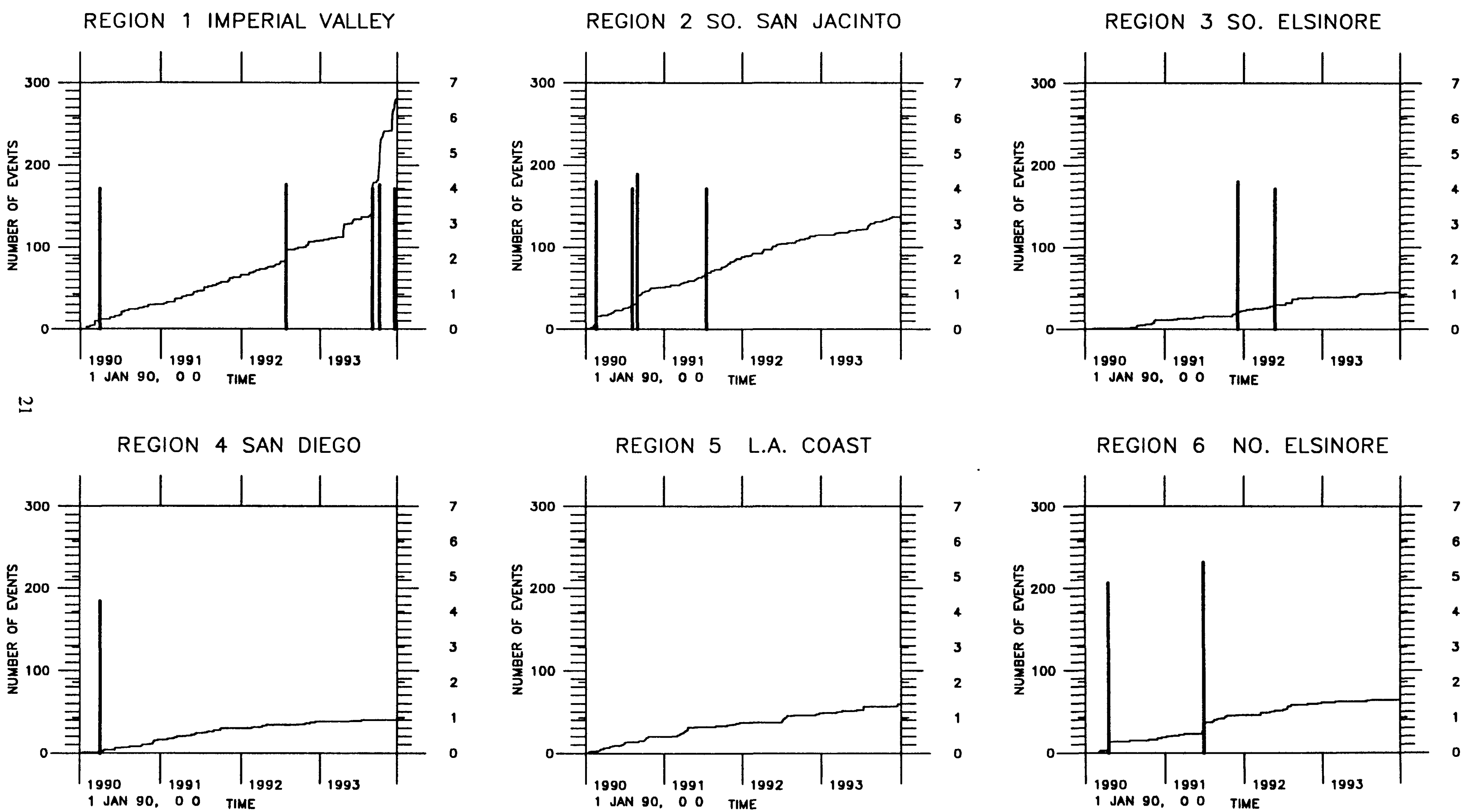

Figure 6a. Cumulative number of events ($M_L \geq 2.5$) in sub-regions 1 through 6 over the four year period ending December 1993. The boundaries of the sub-regions are shown in Figure 5. Vertical bars represent time and magnitude (scale on right) of large events ($M_L \geq 4.0$). Note that the vertical scales of the plots may not be the same.

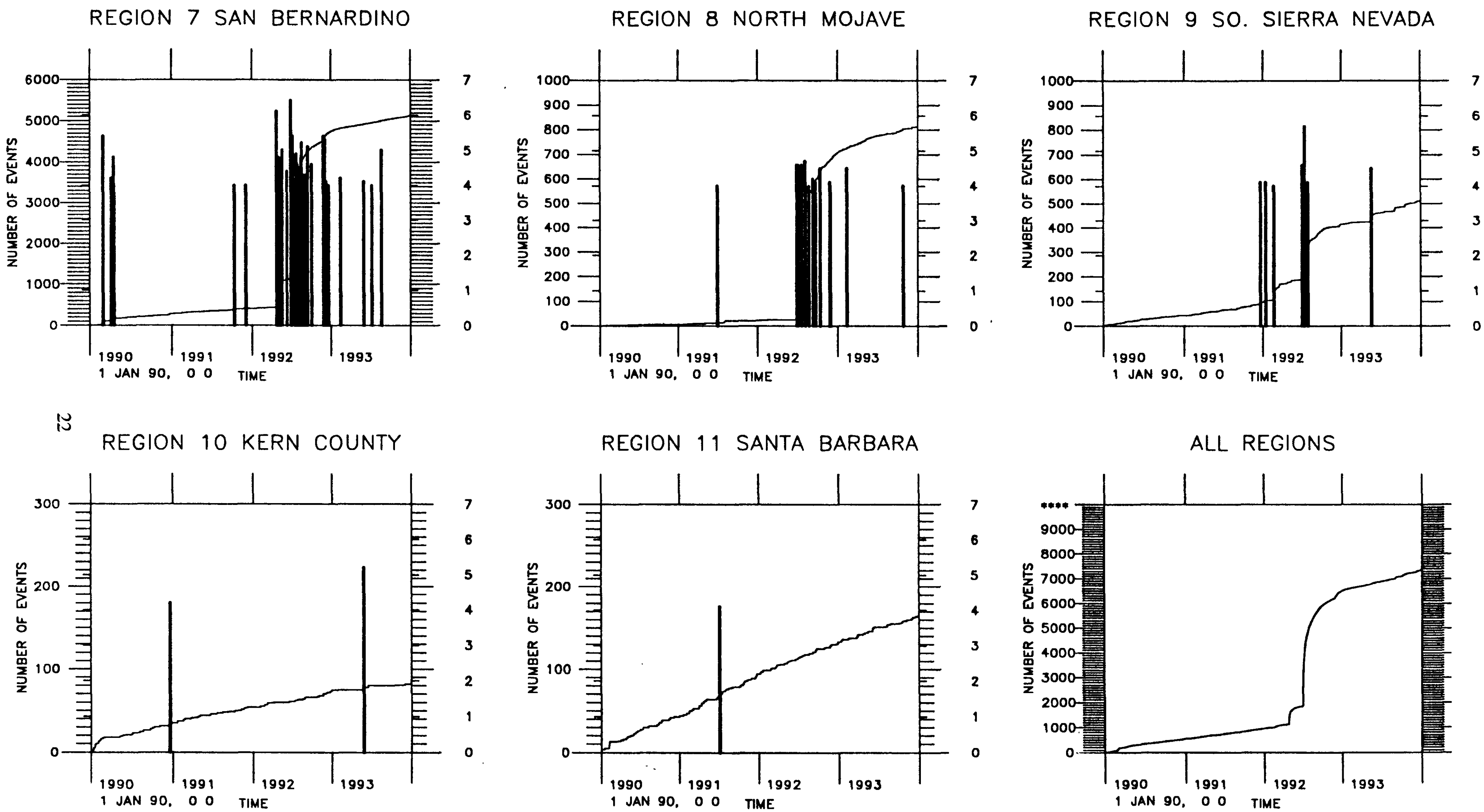

Figure 6b. Cumulative number of events ($M_L \geq 2.5$) in sub-regions 7 through 11 and for all sub-regions over the four year period ending December 1993. The boundaries of the sub-regions are shown in Figure 5. Vertical bars represent time and magnitude (scale on right) of large events ($M_L \geq 4.0$). Note that the vertical scales of the plots may not be the same.

North Mojave - Region 8

Following the Landers earthquake on June 28, the Barstow area began experiencing swarms of seismic activity. This area remained seismically active in 1993 with eight earthquakes of M3.5+ and more of M3.0+. The largest earthquake in the Barstow sequence this year was an M4.5 that occurred on February 11 (Figure 4, Number 1). Many of the M3.0+ events were felt in the immediate area.

South Sierra Nevada - Region 9

The largest event by far in this area (actually north of the defined area) was the M6.2 Eureka Valley earthquake on May 17 located 37 miles ESE of Bishop. Because this event is outside of the Southern California Seismic Network and was covered by the Northern California Seismic Network, it will not be discussed further.

The Coso area, which commonly experiences swarms of activity, lived up to expectations with several swarms throughout the year. The first one occurred in late May with the largest event being an M4.7 that was felt in Ridgecrest and other towns in the northern Mojave Desert and southern Owens Valley. An M3.6 occurred in the same area on July 20, and then the swarm activity picked up again in late August. An M3.9 followed by an M3.3 occurred on October 21 and 22, respectively.

There was a swarm 24 miles NNE of Lake Isabella that took place mostly September 4-6 that resulted in a total of 66 events. The largest event in this sequence was an M3.6 that had a focal mechanism indicating slip on a normal fault.

Kern County - Region 10

The Wheeler Ridge area, SSW of Bakersfield produced an M5.2 earthquake on May 28 that was widely felt as far away as Pasadena (Figure 4, Number 4). It was followed by a sparse aftershock sequence of only 22 events of M1.0 or greater. This was an interesting event because the epicenter was at 22 km depth, deeper than most events in the area (0-18 km). Furthermore, the focal mechanism indicated a strike-slip sense of motion on a WNW-NNE striking fault so the event could not have been on the San Andreas Fault as first speculated.

Santa Barbara - Region 11

A couple of events were felt in this region from offshore events during the year. The first occurred on June 4, an M3.1, and the second was on October 13 with a magnitude of 3.5.

An M3.2 in the Magic Mountain area was felt on October 21.

References

Allen, R.V., Automatic earthquake recognition and timing from single traces, *Bull. Seism. Soc. Am., 68,* 1521-1532, 1978.

Dollar, R.S., Realtime CUSP: automated earthquake detection system for large networks, *U.S. Geological Survey Open-File Report 89-320,* 3pp., 1989.

Hadley, D.M., and H. Kanamori, Seismic structure of the Transverse Ranges, California, *Geol. Soc. Am. Bull., 88,* 1461-1478, 1977.

Hanks, T.C., and H. Kanamori, A moment magnitude scale, *J. Geophys. Res., 84,* 2348-2350, 1979.

Heaton, T.H., A model for a seismic computerized alert network, *Science, 228,* 987-990, 1985.

Hill, D.P., Seismicity in the western United States remotely triggered by the M7.4 Landers, California, earthquake of June 28, 1992, *Science, 260,* 1617-1623, 1993.

Klein, F.W., User's guide to HYPOINVERSE, a program for the VAX and professional 350 computers to solve for earthquake locations, *U.S. Geological Survey Open-File Report 89-314,* 40pp., 1989.

Scott, J., E. Hauksson, H. Kanamori, and J. Mori, Global positioning system re-survey of southern California seismic network stations, submitted to *Bull. Seism. Soc. Am.*

Sieh, K.L., L. Jones, E. Hauksson, K. Hudnut, D. Eberhart-Phillips, T. Heaton, S. Hough, K. Hutton, H. Kanamori, A. Lilje, S. Lindval, S.F. McGill, J. Mori, C. Rubin, J.A. Spotila, J. Stock, H. Thio, J. Treiman, B. Wernicke, and J. Zachariasen, Near-field investigation of the Landers earthquake sequence, April to July, 1992, *Science, 260,* 171-176, 1993.

Stewart, S.A. and M.E. O'Neill, Calculation of the frequency response of the USGS telemetered short-period seismic system, *U.S. Geological Survey Open-File Report 80-143,* 83pp., 1980.

Wald, L.A., L.K. Hutton, J. Mori, D.D. Given and L. M. Jones, The southern California network bulletin, January - December, 1990: *U.S. Geological Survey Open-File Report 91-255,* 45 pp., 1991.

Acknowledgements

We would like the thank Jennifer Scott for all her hard work re-surveying the SCSN stations and providing the data for this Network Bulletin. Tom Heaton helped with the original article entitled "Landers: One Year Later". Jim Mori provided Figure 1 of the SCSN and TERRAscope stations. Thanks to Sue Hough for her review.

Appendix A

Significant Southern California Earthquakes

All events of $M_L \geq 3.0$ for the period January to December 1993. Times are GMT, Z is the depth in km, Q is the overall quality of the location, RMS is the rootmeansquare of the location error, and PH is the number of phases picked. The CUSPID is the unique number assigned to the event by the CUSP system. FM denotes the number of the accompanying focal mechanism in Figure 9. Note that these events have not been finalized, therefore their magnitudes may not be correct. In most cases, if the magnitude is incorrect, it is really larger than indicated.

DATE			TIME			LOCATION				Q	MAG	Z	PHS	RMS	CUSPID	FM
1993	1	3	11	46	41.13	34	36.61	116	38.15	A	3.0	3.02	60	0.20	3085949	
1993	1	4	0	32	23.04	34	17.27	116	46.34	B	3.8	5.64	75	0.16	3086020	
1993	1	5	20	4	41.77	34	58.95	116	58.40	A	3.1	6.28	47	0.15	2078998	
1993	1	11	5	51	29.18	34	23.47	116	27.70	A	3.0	3.09	35	0.11	3087242	
1993	1	13	2	5	2.66	34	2.79	116	42.06	A	3.1	10.39	93	0.19	3087547	
1993	1	13	7	2	37.43	34	6.34	116	38.40	A	3.0	4.05	58	0.17	3087578	
1993	1	13	9	39	30.52	34	55.43	116	54.96	A	3.0	0.00	50	0.18	3087585	
1993	1	17	13	56	40.79	34	14.41	117	26.39	A	3.1	12.79	55	0.15	3088192	
1993	1	18	9	30	33.54	34	36.80	116	38.04	A	3.5	5.21	51	0.17	3088341	
1993	1	18	11	55	33.69	34	36.63	116	38.14	A	3.6	8.98	33	0.12	3088355	
1993	1	18	14	59	41.51	33	12.02	115	35.75	A	3.1	4.36	30	0.20	3088360	
1993	1	24	21	9	26.26	35	38.15	118	27.29	A	3.2	8.94	32	0.08	3089127	
1993	1	26	1	27	13.98	33	57.90	116	20.22	A	3.2	5.47	43	0.13	3089241	
1993	1	28	23	56	52.64	34	58.41	116	56.01	A	3.0	0.00	82	0.22	3089592	
1993	1	31	11	56	32.25	33	45.26	116	8.03	A	3.5	2.21	65	0.13	3089876	
1993	2	1	6	1	39.73	34	14.24	116	48.23	A	3.2	2.13	28	0.12	3089961	
1993	2	1	7	17	39.70	34	59.27	116	56.88	A	3.0	4.80	39	0.16	3089964	
1993	2	9	20	24	47.09	34	29.95	116	31.60	B	3.1	8.41	54	0.12	3091843	
1993	2	10	7	41	52.92	34	1.31	117	35.00	A	3.1	3.26	56	0.16	3091893	
1993	2	10	17	0	38.25	34	23.36	116	27.16	C	3.2	6.00	50	0.14	3091929	
1993	2	11	12	39	36.96	35	1.57	116	58.36	A	4.5	3.34	99	0.23	3092017	1
1993	2	11	15	54	5.43	35	1.11	116	58.31	A	3.5	4.17	74	0.22	3092026	
1993	2	14	20	45	55.45	36	14.11	120	25.13	C	3.2	6.00	12	0.16	3092350	
1993	2	15	7	59	33.17	34	24.28	116	27.87	C	4.2	6.00	78	0.15	3092410	2
1993	2	19	17	36	27.40	34	18.38	116	51.50	A	3.1	2.78	46	0.14	3093087	
1993	2	21	8	57	12.44	34	10.09	116	25.76	A	3.1	7.55	74	0.19	3093261	
1993	3	1	2	19	19.72	34	56.93	116	56.07	A	3.0	0.01	55	0.21	3094237	
1993	3	1	7	31	7.68	35	1.79	116	58.00	A	3.1	3.72	58	0.17	3094255	
1993	3	8	9	9	2.11	33	59.80	117	12.40	A	3.0	12.63	84	0.17	3095148	
1993	3	8	20	38	59.05	34	55.77	116	51.38	A	3.4	0.01	100	0.24	3095205	
1993	3	14	7	13	59.41	35	58.11	120	24.79	C	3.3	6.00	30	0.43	3095965	
1993	3	16	7	50	13.54	34	13.44	116	45.40	A	3.5	1.79	138	0.20	3096210	
1993	3	19	18	23	50.66	34	52.51	116	56.81	A	3.6	7.98	96	0.21	3096746	
1993	3	20	6	56	55.36	34	0.72	117	13.18	A	3.8	9.10	139	0.18	3096843	
1993	3	22	13	8	16.91	34	28.07	116	30.48	A	3.3	2.61	88	0.18	3097141	
1993	3	22	15	41	42.71	33	29.40	116	24.08	A	3.1	11.51	63	0.22	3097155	
1993	3	28	2	57	55.30	32	0.18	116	17.97	D	3.3	6.00	6	0.16	3098012	
1993	3	29	19	33	19.41	36	23.92	117	53.01	C	3.6	6.00	41	0.25	3098241	
1993	3	31	18	8	14.88	32	48.45	118	21.67	C	3.3	6.00	35	0.42	3098516	
1993	4	1	16	55	39.47	34	55.45	116	51.85	A	3.2	0.01	62	0.18	2105574	
1993	4	3	2	14	13.29	34	59.63	116	56.76	A	3.6	5.51	113	0.26	3099126	
1993	4	4	5	21	26.01	35	56.02	120	30.42	B	4.2	11.75	55	0.22	3099250	3
1993	4	7	6	55	24.23	32	54.01	118	25.95	C	3.5	6.00	37	0.36	3099605	
1993	4	8	0	16	7.74	32	52.33	118	27.74	C	3.6	6.00	79	0.32	3099740	
1993	4	8	2	10	33.69	35	57.62	120	31.07	B	3.0	10.14	25	0.19	3099763	
1993	4	8	20	19	33.76	34	1.37	116	19.40	A	3.2	10.87	57	0.20	3099838	
1993	4	11	19	47	43.54	34	8.60	116	52.51	A	3.1	7.65	75	0.15	3100174	
1993	4	12	8	32	27.46	34	8.61	116	52.60	A	3.2	8.40	89	0.15	3100215	
1993	4	12	10	56	44.40	32	47.52	116	6.96	A	3.0	3.37	27	0.30	3100226	
1993	4	12	11	18	32.84	34	8.56	116	52.52	A	3.3	6.00	112	0.19	3100228	
1993	4	16	14	35	22.51	34	0.25	116	19.23	C	3.1	5.57	60	0.17	3101127	
1993	4	17	12	43	3.06	34	5.73	116	26.43	A	3.7	10.70	100	0.22	3101250	
1993	4	17	12	55	45.42	34	5.83	116	26.36	A	3.0	9.27	76	0.21	3101253	
1993	4	19	17	57	19.41	35	1.74	116	59.16	A	3.1	3.84	67	0.23	3101460	

DATE			TIME			LOCATION				Q	MAG	Z	PHS	RMS	CUSPID	FM
1993	4	22	0	26	52.57	34	58.48	116	56.41	A	3.8	4.04	78	0.21	3101853	
1993	4	22	11	3	35.43	32	24.27	115	7.27	C	3.6	6.00	25	0.49	3101895	
1993	4	22	11	41	6.25	32	24.49	115	6.51	C	3.2	6.00	21	0.42	3101903	
1993	4	22	14	46	4.80	32	23.36	115	5.98	C	3.2	6.00	26	0.42	3101933	
1993	4	22	15	40	30.51	32	23.53	115	6.10	C	3.2	6.00	22	0.37	3101936	
1993	4	27	7	18	9.45	34	3.88	117	16.48	A	3.3	15.78	87	0.17	3102466	
1993	4	29	0	48	37.26	33	57.61	119	10.31	C	3.1	6.00	48	0.41	3102686	
1993	5	1	6	40	7.33	34	9.04	116	25.36	B	3.3	6.21	85	0.22	3102951	
1993	5	2	9	28	43.90	35	56.91	120	30.81	B	3.1	12.13	44	0.26	3103062	
1993	5	8	11	57	48.40	34	57.16	116	55.74	A	3.5	0.00	112	0.27	3103949	
1993	5	12	0	46	55.45	34	58.38	116	57.87	A	3.8	0.14	99	0.22	3104334	
1993	5	16	3	44	48.84	36	6.19	117	42.07	A	3.2	1.34	50	0.20	3104898	
1993	5	16	10	13	28.06	33	58.77	116	22.23	A	3.1	5.44	67	0.16	3104937	
1993	5	16	19	1	19.72	35	43.45	116	28.86	C	3.3	6.00	30	0.18	3104993	
1993	5	18	17	9	5.88	34	17.38	117	28.84	A	3.7	10.22	120	0.22	3105604	
1993	5	20	9	19	43.74	36	5.65	117	42.10	A	3.4	0.53	30	0.21	3106108	
1993	5	20	9	19	53.43	36	6.30	117	41.94	A	3.4	0.99	45	0.21	3106205	
1993	5	20	9	20	36.61	36	5.40	117	42.54	B	3.2	0.01	26	0.22	3106206	
1993	5	20	20	14	14.50	36	5.69	117	42.11	A	4.5	0.78	140	0.21	3106252	
1993	5	20	20	34	46.45	36	5.88	117	42.09	A	3.4	0.93	69	0.18	3106257	
1993	5	20	21	14	19.79	36	5.11	117	42.47	A	3.4	0.81	40	0.19	3106271	
1993	5	21	1	24	49.95	36	6.17	117	41.90	A	3.4	1.24	48	0.20	3106323	
1993	5	21	8	59	15.95	36	5.85	117	42.33	A	3.4	1.47	51	0.21	3106394	
1993	5	23	12	6	13.28	34	30.03	116	30.73	C	3.3	4.99	69	0.13	3106767	
1993	5	24	16	27	48.26	34	1.83	116	19.62	B	3.2	6.48	70	0.18	3106978	
1993	5	25	0	17	57.76	34	7.24	116	23.95	A	3.2	0.06	80	0.19	3107022	
1993	5	27	8	39	37.52	36	9.61	120	12.45	C	3.3	6.00	18	0.22	3107365	
1993	5	28	4	47	40.60	35	8.96	119	6.22	A	5.2	21.43	156	0.29	3107503	4
1993	5	29	0	12	28.87	36	5.38	117	42.26	A	3.0	0.01	45	0.18	3107622	
1993	5	31	8	55	29.99	34	7.19	116	59.72	A	4.1	5.69	65	0.19	3107911	5
1993	6	1	0	34	25.26	32	17.03	115	16.76	C	3.2	6.00	32	0.50	3107990	
1993	6	2	0	41	31.27	32	18.53	115	16.34	C	3.1	6.00	20	0.37	3108125	
1993	6	4	8	59	47.95	34	23.55	119	44.55	A	3.1	2.09	60	0.35	3108476	
1993	6	5	11	55	55.70	34	8.85	116	25.31	A	3.6	3.85	81	0.18	3108625	
1993	6	5	23	58	5.75	32	48.77	115	36.16	A	3.2	15.83	50	0.30	3108745	
1993	6	7	21	53	51.73	32	53.15	115	40.08	A	3.1	9.68	41	0.35	3109049	
1993	6	8	21	20	15.02	34	7.46	116	59.56	A	3.2	6.00	94	0.17	3109221	
1993	6	12	4	23	29.00	33	24.61	116	24.93	B	3.1	7.49	24	0.22	3109664	
1993	6	12	5	21	44.50	32	20.25	115	14.66	C	3.8	6.00	36	0.59	3109673	
1993	6	16	3	57	37.60	34	49.27	119	2.01	A	3.4	11.44	77	0.21	3110131	
1993	6	19	7	20	26.40	34	4.71	116	20.96	A	3.2	1.97	85	0.20	3110524	
1993	6	22	11	15	41.99	32	42.92	115	59.01	A	3.6	0.68	33	0.28	3110850	
1993	6	22	23	8	10.94	34	37.56	116	37.34	A	3.8	7.81	80	0.18	3110951	
1993	6	26	12	48	2.46	34	4.57	116	20.88	A	3.6	2.38	96	0.22	3111385	
1993	6	28	23	43	32.25	34	8.73	116	25.26	C	3.1	5.98	69	0.19	3111652	
1993	6	30	3	18	5.35	35	0.56	116	57.59	A	3.1	0.01	77	0.19	3111759	
1993	7	7	22	7	37.13	34	15.09	116	53.85	A	3.4	10.60	91	0.18	3112621	
1993	7	8	18	27	9.98	34	57.40	116	47.10	A	3.8	2.95	93	0.21	3112722	
1993	7	8	22	57	44.87	34	14.71	116	25.74	A	4.0	2.41	77	0.17	3112773	6
1993	7	11	5	0	44.85	34	45.76	117	29.73	A	3.1	0.79	74	0.15	3113023	
1993	7	13	0	51	25.47	33	31.23	118	20.77	A	3.3	1.52	47	0.26	3113227	
1993	7	13	1	16	54.68	33	31.51	118	21.79	A	3.1	0.59	35	0.22	3113230	
1993	7	18	4	39	58.10	34	20.46	116	28.66	A	3.6	5.10	30	0.16	3114009	
1993	7	20	17	23	54.67	33	55.27	116	52.92	A	3.1	11.62	64	0.14	3114186	
1993	7	21	0	21	29.53	36	7.06	117	41.37	A	3.2	0.55	43	0.18	3114279	
1993	7	21	0	23	9.70	36	7.17	117	41.40	A	3.5	0.76	44	0.17	3114255	
1993	7	26	21	29	49.50	33	58.90	118	44.24	A	3.6	13.36	68	0.32	3115142	
1993	7	29	16	8	9.14	33	15.12	116	8.19	A	3.5	11.75	84	0.31	3115600	
1993	7	29	21	31	28.71	35	1.49	116	58.38	A	3.3	4.45	82	0.20	3115644	
1993	8	2	21	4	25.55	34	6.88	116	44.66	A	3.3	9.56	92	0.15	3115988	
1993	8	4	8	11	24.39	34	2.11	117	33.57	A	3.5	7.42	107	0.18	3116168	
1993	8	4	14	3	27.26	34	22.60	116	27.41	A	3.1	3.64	57	0.12	3116195	
1993	8	7	13	43	42.65	36	24.93	120	4.01	C	3.5	6.00	50	0.31	3116598	
1993	8	7	13	44	10.67	34	40.65	116	42.46	A	3.0	3.71	30	0.20	2119302	
1993	8	8	1	24	47.82	34	30.75	116	31.62	B	3.1	5.35	55	0.15	3116651	
1993	8	8	18	53	10.22	33	42.96	119	10.20	C	3.1	6.00	32	0.30	3116722	

DATE			TIME			LOCATION				Q	MAG	Z	PHS	RMS	CUSPID	FM
1993	8	9	1	55	0.56	34	0.78	117	6.30	A	3.0	8.25	116	0.17	3116768	
1993	8	11	16	13	44.12	34	10.69	116	25.78	A	3.1	4.84	67	0.16	3117122	
1993	8	14	2	9	11.04	34	0.04	117	11.48	A	3.0	15.20	97	0.19	3117458	
1993	8	16	9	12	16.07	34	36.00	116	37.76	A	3.3	3.95	70	0.19	3117713	
1993	8	18	7	43	45.28	36	1.32	120	4.03	C	3.3	6.00	33	0.43	3117999	
1993	8	19	6	22	15.03	35	55.86	115	44.25	D	3.2	6.00	60	0.33	3118153	
1993	8	21	1	46	38.40	34	1.76	116	19.27	A	5.0	9.05	167	0.23	3118441	7
1993	8	22	18	8	32.96	36	29.45	117	38.97	C	3.4	6.00	57	0.27	3118670	
1993	8	31	7	59	32.00	34	57.01	116	55.94	A	3.1	0.01	59	0.19	3119967	
1993	8	31	18	52	21.52	36	4.79	117	43.11	A	3.0	1.73	38	0.18	3120036	
1993	9	1	13	50	19.74	32	57.87	115	46.92	A	3.7	6.57	20	0.22	2122161	
1993	9	1	13	51	3.18	36	4.79	117	42.95	A	3.3	0.82	39	0.20	3120136	
1993	9	5	1	51	20.25	35	59.01	118	21.34	A	3.2	0.00	56	0.20	3120603	
1993	9	5	2	13	36.62	35	59.03	118	21.25	A	3.0	0.00	51	0.20	3120608	
1993	9	5	6	15	8.82	35	58.81	118	21.12	A	3.1	0.00	88	0.23	3120643	
1993	9	6	2	20	5.79	32	21.74	115	20.19	C	3.1	6.00	33	0.40	3120757	
1993	9	6	8	25	23.06	34	8.47	116	50.21	A	3.9	9.59	113	0.15	3120810	
1993	9	6	10	32	33.09	35	59.03	118	21.27	A	3.7	0.01	61	0.20	3120820	
1993	9	6	22	20	6.46	32	24.56	115	20.73	C	3.0	6.00	31	0.47	3120934	
1993	9	6	22	20	42.86	32	20.45	115	21.00	C	3.0	6.00	16	0.35	3121167	
1993	9	6	22	30	12.90	32	21.48	115	21.08	C	3.8	6.00	46	0.52	3120938	
1993	9	7	9	43	17.95	34	10.03	116	25.99	B	3.2	7.32	83	0.20	3121033	
1993	9	7	11	24	26.95	32	22.38	115	21.37	C	4.0	6.00	50	0.57	3121053	
1993	9	7	11	33	22.22	32	22.42	115	20.72	C	3.2	6.00	37	0.55	3121056	
1993	9	7	11	34	28.59	32	22.72	115	21.52	C	3.0	6.00	16	0.31	2122961	
1993	9	7	12	12	33.06	32	21.03	115	20.98	C	3.5	6.00	33	0.52	3121265	
1993	9	7	12	12	45.78	32	16.68	115	19.55	D	3.4	6.00	12	0.30	3121268	
1993	9	7	12	13	46.99	32	21.68	115	20.54	C	3.3	6.00	23	0.38	3121074	
1993	9	7	12	38	39.87	32	22.38	115	20.36	C	3.0	6.00	28	0.48	3121089	
1993	9	7	12	41	20.18	32	21.08	115	20.97	C	3.4	6.00	17	0.31	3121217	
1993	9	7	12	59	21.84	32	21.37	115	21.50	C	3.7	6.00	31	0.47	3121101	
1993	9	7	13	40	48.48	32	19.75	115	21.28	C	3.2	6.00	24	0.45	3121110	
1993	9	7	16	41	52.57	34	16.09	116	27.05	A	3.5	0.45	113	0.17	3121150	
1993	9	8	0	19	54.67	33	37.57	119	2.44	A	3.1	11.98	57	0.37	3121240	
1993	9	8	1	1	44.07	35	57.03	115	42.64	D	3.8	6.00	43	0.45	3121253	
1993	9	8	7	20	17.94	32	21.43	115	21.54	C	3.1	6.00	29	0.49	3121311	
1993	9	9	5	9	8.98	35	55.14	115	44.64	D	3.6	6.00	41	0.24	3121532	
1993	9	10	3	38	5.16	34	25.24	116	28.33	A	3.0	2.64	70	0.14	3121671	
1993	9	10	15	20	36.76	32	22.35	115	22.07	C	3.0	6.00	27	0.46	3121728	
1993	9	10	15	56	35.41	34	21.50	116	27.29	A	3.0	7.94	63	0.15	3121732	
1993	9	14	4	29	13.58	34	22.99	116	27.32	A	3.3	1.45	81	0.15	3122130	
1993	9	14	8	18	57.70	34	0.93	116	19.06	A	3.2	3.13	99	0.23	3122158	
1993	9	14	14	49	3.63	34	22.99	116	27.53	A	3.3	1.32	79	0.16	3122252	
1993	9	25	15	23	23.94	32	22.58	115	3.10	C	3.0	6.00	27	0.54	3123776	
1993	9	27	20	15	22.53	35	47.21	120	18.20	C	3.5	6.00	44	0.41	3124048	
1993	9	29	10	59	50.31	34	18.70	117	41.37	A	3.3	3.75	93	0.28	3124395	
1993	10	4	2	57	36.70	34	0.75	116	20.56	A	3.6	1.70	97	0.22	3125013	
1993	10	4	14	53	1.64	35	0.64	116	57.92	A	3.0	4.26	61	0.20	3125106	
1993	10	6	13	44	25.72	34	59.02	116	58.60	A	3.1	5.17	67	0.19	3125576	
1993	10	8	18	30	1.08	34	23.30	116	27.74	C	3.5	5.58	80	0.15	3125934	
1993	10	9	15	14	9.65	32	21.15	115	3.24	C	3.1	6.00	18	0.43	3126099	
1993	10	11	1	35	53.34	33	15.24	116	14.02	A	3.0	9.40	72	0.30	3126422	
1993	10	11	5	5	42.59	32	22.81	115	3.18	C	3.0	6.00	16	0.41	3126437	
1993	10	11	18	59	45.05	32	21.94	115	4.06	C	4.1	6.00	28	0.46	3126585	
1993	10	12	1	41	1.26	32	22.60	115	4.10	C	3.2	6.00	25	0.44	3126657	
1993	10	13	0	39	0.67	32	23.98	115	3.80	C	3.8	6.00	22	0.48	3126797	
1993	10	13	9	54	2.67	34	49.37	120	56.94	C	3.5	6.00	32	0.32	3126880	
1993	10	15	18	57	9.44	34	14.51	116	25.47	A	3.1	2.57	76	0.15	3127281	
1993	10	17	11	43	44.60	35	8.96	116	34.07	A	3.2	11.28	33	0.22	3127509	
1993	10	19	2	40	29.07	34	11.87	116	25.90	C	3.4	5.75	80	0.17	3127836	
1993	10	21	14	37	11.55	36	9.33	118	1.96	A	3.8	0.00	69	0.24	3128215	
1993	10	21	16	22	30.82	34	24.91	118	34.20	A	3.1	3.97	115	0.23	3128251	
1993	10	22	16	30	53.41	36	3.26	117	58.06	A	3.7	0.00	72	0.21	3128523	
1993	10	22	17	6	39.27	36	3.13	117	57.85	A	3.1	0.01	68	0.21	3128525	
1993	10	22	17	33	9.58	36	3.28	117	58.08	A	3.0	0.01	59	0.20	3128529	
1993	10	23	4	44	42.17	34	58.20	116	57.76	A	3.2	0.02	74	0.20	3128761	

DATE			TIME			LOCATION				Q	MAG	Z	PHS	RMS	CUSPID	FM
1993	10	23	19	3	9.52	36	3.21	117	58.06	A	3.2	0.01	59	0.20	3128834	
1993	10	25	0	18	49.44	34	56.50	116	47.44	A	3.6	3.14	113	0.22	3129007	
1993	10	26	4	28	37.84	32	14.93	114	58.21	C	3.0	6.00	12	0.26	2128862	
1993	10	26	4	51	19.54	36	15.55	120	48.92	C	3.0	6.00	10	0.22	3129170	
1993	10	26	9	24	7.36	34	56.84	116	39.12	C	4.0	6.00	117	0.23	3129223	8
1993	10	26	13	57	36.87	32	18.98	115	4.60	C	3.0	6.00	20	0.36	2128842	
1993	10	28	0	9	7.95	35	13.78	118	4.56	A	3.6	8.39	85	0.18	3129478	
1993	10	29	9	11	34.60	33	11.43	115	36.51	B	3.2	6.02	49	0.32	3129681	
1993	10	29	18	15	20.64	32	25.98	114	59.94	C	3.0	6.00	10	0.19	3129717	
1993	10	31	18	31	24.26	36	18.20	120	20.91	C	3.1	6.00	40	0.26	3130013	
1993	11	3	4	27	3.58	36	18.14	120	21.58	C	3.2	6.00	28	0.26	3130306	
1993	11	3	12	14	27.30	35	55.62	115	43.13	D	3.1	6.00	29	0.19	3130330	
1993	11	3	12	15	30.72	35	52.15	115	39.42	D	3.4	6.00	8	0.35	2129875	
1993	11	4	0	36	53.75	33	49.44	115	39.39	A	3.5	0.00	62	0.23	3130427	
1993	11	4	23	15	38.65	34	37.27	116	39.66	A	3.3	6.15	77	0.16	3130544	
1993	11	7	21	43	40.41	34	33.10	119	9.51	A	3.2	10.44	68	0.18	3130868	
1993	11	10	6	49	35.43	35	48.82	116	46.84	C	3.2	6.00	11	0.15	3131192	
1993	11	12	5	31	9.56	35	40.61	118	19.45	A	3.5	10.82	95	0.18	3131521	
1993	11	13	21	14	6.69	35	57.16	120	28.50	C	3.0	6.00	32	0.41	3131726	
1993	11	14	12	25	35.40	35	57.89	120	30.43	A	4.6	18.00	114	0.36	3131777	9
1993	11	18	20	37	33.50	34	10.09	116	25.59	B	3.5	11.52	13	0.11	3132529	
1993	11	20	6	15	0.33	34	19.41	116	27.68	C	3.5	6.17	9	0.12	3132688	
1993	11	25	2	46	35.00	35	57.45	115	42.00	D	3.6	6.00	61	0.38	3133535	
1993	11	25	20	27	6.85	34	5.17	116	25.43	A	3.1	9.38	97	0.20	3133608	
1993	11	26	20	18	56.02	32	51.72	115	40.63	A	3.0	10.79	41	0.35	3133680	
1993	12	3	1	51	24.75	34	15.56	116	43.26	A	3.8	1.61	114	0.18	3134575	
1993	12	8	2	49	38.98	32	21.39	115	21.23	C	3.9	6.00	38	0.57	3135316	
1993	12	8	3	2	50.10	32	21.53	115	21.33	C	3.2	6.00	33	0.56	3135318	
1993	12	8	3	6	17.38	32	18.25	115	21.51	C	3.2	6.00	12	0.24	3135319	
1993	12	8	3	10	14.35	32	20.45	115	20.89	C	3.0	6.00	16	0.31	3135321	
1993	12	8	3	10	44.95	32	18.15	115	21.23	C	3.3	6.00	13	0.27	3135479	
1993	12	8	4	32	37.13	32	19.21	115	21.00	C	3.0	6.00	17	0.35	3135496	
1993	12	8	5	0	30.24	32	20.50	115	21.59	C	3.0	6.00	16	0.32	3135367	
1993	12	8	8	47	30.10	32	20.17	115	21.44	C	3.3	6.00	23	0.42	3135564	
1993	12	8	9	6	28.81	35	0.51	116	57.95	A	3.7	2.33	87	0.20	3135409	
1993	12	9	0	7	0.63	32	21.60	115	20.87	C	3.1	6.00	31	0.51	3135582	
1993	12	9	0	7	32.64	32	22.03	115	21.00	C	3.6	6.00	18	0.36	3135614	
1993	12	9	4	18	10.10	32	22.05	115	21.36	C	3.1	6.00	31	0.50	3135621	
1993	12	10	10	10	10.50	34	1.06	117	6.50	A	3.2	8.17	155	0.19	3135799	
1993	12	14	18	4	44.24	36	4.62	117	43.17	A	3.2	1.26	51	0.19	3136399	
1993	12	17	14	28	21.44	33	13.97	118	1.45	C	3.4	6.00	61	0.32	3136728	
1993	12	18	15	44	44.14	32	21.94	115	21.78	C	3.2	6.00	39	0.60	3136826	
1993	12	18	15	59	44.62	32	18.97	115	21.01	C	3.1	6.00	24	0.50	3136828	
1993	12	18	16	0	18.96	32	22.18	115	21.00	D	3.3	6.00	12	0.32	3136870	
1993	12	18	16	12	8.00	32	20.33	115	21.13	C	3.1	6.00	23	0.44	3136830	
1993	12	20	17	37	2.49	32	21.93	115	21.54	C	4.0	6.00	50	0.62	3137057	
1993	12	21	12	9	20.91	34	15.18	116	26.12	A	3.2	4.17	8	0.08	3137184	
1993	12	22	4	25	48.45	34	23.43	116	28.10	B	3.9	3.36	8	0.07	3137290	
1993	12	23	10	50	45.11	34	11.03	116	26.54	C	3.5	17.11	9	0.12	3137475	
1993	12	23	16	35	56.45	34	9.71	116	26.03	C	3.2	11.18	9	0.14	3137501	
1993	12	24	14	6	53.02	34	24.36	116	28.10	C	3.4	2.93	9	0.26	3137596	
1993	12	26	16	36	18.89	34	16.46	116	26.90	A	3.8	0.99	4	0.01	3137973	

Appendix B

New SCSN GPS Locations in NAD-83

This table lists all the stations that have been recorded from past and present (as of December 31, 1993) by the Southern California Seismic Network with their new GPS location. The new locations include three changes: The locations were determined by using differential Global Positioning System (GPS) positioning from carrier phase measurements; the latitudes and longitudes are reported in the NAD-83 coordinate system which coincides with the WGS-84 GPS reference frame; and the heights are measured relative to the WGS-84 reference ellipsoid rather than sea level (Scott *et al.*, 1994). Those stations that have not yet been re-surveyed are listed second. These have been transformed to the NAD-83 coordinate system for consistency.

A station list of all SCSN stations past and present can be found on the SCEC Data Center (scec2.gps.caltech.edu) in /export/scec2/data1/stations/SCSNstatlist. The format for this file is in the *man* pages.

Note that this list includes any station codes that have ever appeared in a .MEM file including typos. Also, aliases for stations are listed separately.

Stations Surveyed by Differential GPS:

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
ABL	34 50 54.4	-119 13 29.9	1975	34.84845	-119.22497
ADL	34 33 20.9	-117 25 5.0	868	34.55581	-117.41804
ALH	34 1 10.3	-118 17 1.6	20	34.01953	-118.28377
ALHE	34 1 10.3	-118 17 1.6	20	34.01953	-118.28377
ALHN	34 1 10.3	-118 17 1.6	20	34.01953	-118.28377
ALHZ	34 1 10.3	-118 17 1.6	20	34.01953	-118.28377
ARB	34 0 15.5	-117 36 19.4	308	34.00431	-117.60540
ARBE	34 0 15.5	-117 36 19.4	308	34.00431	-117.60540
ARBI	34 0 15.5	-117 36 19.4	308	34.00431	-117.60540
ARBJ	34 0 15.5	-117 36 19.4	308	34.00431	-117.60540
ARBK	34 0 15.5	-117 36 19.4	308	34.00431	-117.60540
ARBN	34 0 15.5	-117 36 19.4	308	34.00431	-117.60540
ARBZ	34 0 15.5	-117 36 19.4	308	34.00431	-117.60540
ARV	35 7 36.7	-118 49 48.3	236	35.12687	-118.83008
AZU	34 13 11.3	-117 54 4.4	1140	34.21980	-117.90121
AZUE	34 13 11.3	-117 54 4.4	1140	34.21980	-117.90121
AZUI	34 13 11.3	-117 54 4.4	1140	34.21980	-117.90121
AZUJ	34 13 11.3	-117 54 4.4	1140	34.21980	-117.90121
AZUK	34 13 11.3	-117 54 4.4	1140	34.21980	-117.90121
AZUN	34 13 11.3	-117 54 4.4	1140	34.21980	-117.90121
AZUZ	34 13 11.3	-117 54 4.4	1140	34.21980	-117.90121
BAR	32 40 48.2	-116 40 19.8	496	32.68005	-116.67215
BARE	32 40 48.2	-116 40 19.8	496	32.68005	-116.67215
BAT	33 27 29.8	-115 50 29.5	-53	33.45828	-115.84153
BC2	33 39 25.3	-115 27 43.3	995	33.65702	-115.46202
BC3	33 39 17.4	-115 27 11.1	1080	33.65484	-115.45309
BCH	35 11 7.5	-120 5 6.8	1109	35.18542	-120.08522
BE2	34 9 40.5	-118 16 57.5	108	34.16124	-118.28264
BERD	33 49 46.6	-116 8 56.4	483	33.82960	-116.14899
BLK	35 5 19.2	-117 13 11.1	619	35.08867	-117.21975
BLU	34 24 24.7	-117 43 40.0	1843	34.40686	-117.72778
BLUV	34 24 24.7	-117 43 40.0	1843	34.40686	-117.72779
BLUZ	34 24 24.7	-117 43 40.0	1843	34.40686	-117.72779
BMT	35 8 11.1	-118 35 50.0	1200	35.13641	-118.59723
BON	32 41 50.4	-115 16 8.5	-14	32.69732	-115.26902
BOO	34 52 34.8	-117 54 39.9	671	34.87632	-117.91109
BRA	32 58 44.4	-115 32 57.7	-67	32.97899	-115.54936
BRAI	32 58 44.4	-115 32 57.7	-67	32.97899	-115.54936
BRAJ	32 58 44.4	-115 32 57.7	-67	32.97899	-115.54936
BRAK	32 58 44.4	-115 32 57.7	-67	32.97899	-115.54936
BRAZ	32 58 44.4	-115 32 57.7	-67	32.97899	-115.54936
BRCI	34 4 8.2	-116 23 32.1	1233	34.06895	-116.39224
BRG	33 10 17.0	-116 10 28.9	205	33.17139	-116.17470
BRS	33 58 17.2	-116 54 45.5	1075	33.97145	-116.91265
BRSE	33 58 17.2	-116 54 45.5	1075	33.97145	-116.91265
BRSI	33 58 17.2	-116 54 45.5	1075	33.97145	-116.91265
BRSJ	33 58 17.2	-116 54 45.5	1075	33.97145	-116.91265

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
BRSK	33 58 17.2	-116 54 45.5	1075	33.97145	-116.91265
BRSN	33 58 17.2	-116 54 45.5	1075	33.97145	-116.91265
BRSZ	33 58 17.2	-116 54 45.5	1075	33.97145	-116.91265
BRT	34 36 43.4	-117 57 48.8	757	34.61206	-117.96354
BTL	34 15 25.1	-117 0 18.7	2527	34.25698	-117.00521
CAH	33 29 34.7	-116 43 25.9	1313	33.49296	-116.72386
CAL	35 6 11.9	-117 56 57.2	690	35.10331	-117.94924
CAV	35 3 2.6	-116 20 43.2	558	35.05071	-116.34534
CBK	32 54 56.9	-116 15 8.1	355	32.91580	-116.25226
CCR	34 21 39.0	-116 56 27.2	1383	34.36082	-116.94090
CCRE	34 21 39.0	-116 56 27.2	1383	34.36083	-116.94090
CCRJ	34 21 39.0	-116 56 27.2	1383	34.36083	-116.94090
CCRK	34 21 39.0	-116 56 27.2	1383	34.36083	-116.94090
CCRN	34 21 39.0	-116 56 27.2	1383	34.36083	-116.94090
CCRZ	34 21 39.0	-116 56 27.2	1383	34.36083	-116.94090
CDY	34 49 48.3	-116 20 13.8	934	34.83007	-116.33717
CFL	34 19 58.6	-118 1 25.9	1560	34.33296	-118.02387
CFLI	34 19 58.6	-118 1 25.9	1560	34.33296	-118.02387
CFLJ	34 19 58.6	-118 1 25.9	1560	34.33296	-118.02387
CFLK	34 19 58.6	-118 1 25.9	1560	34.33296	-118.02387
CFT	34 2 6.7	-117 6 42.8	648	34.03521	-117.11189
CIW	33 27 56.4	-118 33 5.5	87	33.46566	-118.55152
CIWE	33 27 56.4	-118 33 5.5	87	33.46566	-118.55152
CIWN	33 27 56.4	-118 33 5.5	87	33.46566	-118.55152
CIWV	33 27 56.4	-118 33 5.5	87	33.46566	-118.55152
CIWZ	33 27 56.4	-118 33 5.5	87	33.46566	-118.55152
CJV	34 31 47.2	-118 8 40.2	1296	34.52978	-118.14450
CLC	35 48 56.7	-117 35 51.1	735	35.81574	-117.59751
CLI	33 8 25.0	-115 31 35.7	-92	33.14029	-115.52658
CLIE	33 8 25.0	-115 31 35.7	-92	33.14029	-115.52658
CLIN	33 8 25.0	-115 31 35.7	-92	33.14029	-115.52658
CLM	34 5 46.1	-117 43 22.7	317	34.09613	-117.72297
CLME	34 5 46.1	-117 43 22.7	317	34.09613	-117.72297
CLMI	34 5 46.1	-117 43 22.7	317	34.09613	-117.72297
CLMJ	34 5 46.1	-117 43 22.7	317	34.09613	-117.72297
CLMK	34 5 46.1	-117 43 22.7	317	34.09613	-117.72297
CLMN	34 5 46.1	-117 43 22.7	317	34.09613	-117.72297
CLMZ	34 5 46.1	-117 43 22.7	317	34.09613	-117.72297
CO2	33 50 42.9	-115 20 36.6	242	33.84524	-115.34351
COA	32 51 48.3	-115 7 24.2	0	32.86341	-115.12339
COK	32 50 58.1	-115 43 40.4	-50	32.84946	-115.72788
COY	33 21 46.7	-116 18 40.1	218	33.36296	-116.31114
COYV	33 21 46.7	-116 18 40.1	218	33.36296	-116.31114
COYZ	33 21 46.7	-116 18 40.1	218	33.36296	-116.31114
CPE	32 53 32.8	-117 6 5.2	143	32.89244	-117.10143
CPEF	32 53 20.9	-117 6 16.1	132	32.88914	-117.10447
CPM	34 9 15.9	-116 11 51.8	897	34.15442	-116.19771
CPMV	34 9 15.9	-116 11 51.9	897	34.15441	-116.19776
CPMZ	34 9 15.9	-116 11 51.9	897	34.15441	-116.19776
CRG	35 14 31.9	-119 43 29.5	1169	35.24220	-119.72486
CRR	32 53 12.5	-115 58 9.0	66	32.88682	-115.96918
CSP	34 17 52.7	-117 21 30.0	1239	34.29796	-117.35833
CSS	36 1 37.3	-117 46 3.4	1135	36.02702	-117.76761
CTW	33 40 38.2	-115 52 19.7	504	33.67728	-115.87214
CTWV	33 40 38.2	-115 52 19.7	504	33.67728	-115.87214
CTWZ	33 40 38.2	-115 52 19.7	504	33.67728	-115.87214
CWC	36 26 23.6	-118 4 48.6	1553	36.43988	-118.08016
DB2	33 44 6.7	-117 3 46.4	591	33.73521	-117.06289
DBM	34 58 43.6	-118 21 39.8	1162	34.97877	-118.36107
DGR	33 38 59.9	-117 0 34.1	609	33.64996	-117.00948
DH1E	34 0 44.5	-118 23 15.8	-4	34.01236	-118.38771
DH1N	34 0 44.5	-118 23 15.8	-4	34.01236	-118.38771
DH1Z	34 0 44.5	-118 23 15.8	-4	34.01236	-118.38771
DH2	34 0 44.5	-118 23 15.8	-420	34.01236	-118.38771
DH2E	34 0 44.5	-118 23 15.8	-420	34.01236	-118.38771
DH2N	34 0 44.5	-118 23 15.8	-420	34.01236	-118.38771
DH2Z	34 0 44.5	-118 23 15.8	-420	34.01236	-118.38771
DHB	34 0 44.5	-118 23 15.8	-1467	34.01236	-118.38771
DHB1	34 0 44.5	-118 23 15.8	-420	34.01236	-118.38771
DHB2	34 0 44.5	-118 23 15.8	-1437	34.01236	-118.38771
DHBE	34 0 44.5	-118 23 15.8	-1437	34.01236	-118.38771

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
DHBM	34 0 44.5	-118 23 15.8	-1437	34.01236	-118.38771
DHBN	34 0 44.5	-118 23 15.8	-1437	34.01236	-118.38771
DHBZ	34 0 44.5	-118 23 15.8	-1437	34.01236	-118.38771
DR1	33 42 31.8	-117 0 14.0	579	33.70884	-117.00390
DR1E	33 42 31.8	-117 0 14.0	579	33.70884	-117.00390
DR1N	33 42 31.8	-117 0 14.0	579	33.70884	-117.00390
DTP	35 16 2.7	-117 50 44.9	908	35.26742	-117.84581
DWSI	33 45 57.0	-116 32 45.8	162	33.76584	-116.54604
EDCI	33 54 13.6	-116 20 11.3	377	33.90377	-116.33648
EDW	34 52 58.9	-117 59 27.8	762	34.88303	-117.99106
EDWI	34 52 58.9	-117 59 27.8	762	34.88303	-117.99106
EDWJ	34 52 58.9	-117 59 27.8	762	34.88303	-117.99106
EDWK	34 52 58.9	-117 59 27.8	762	34.88303	-117.99106
EDWZ	34 52 58.9	-117 59 27.8	762	34.88303	-117.99106
ELM	34 31 35.0	-117 38 26.3	954	34.52638	-117.64064
ELR	33 8 50.9	-115 50 0.0	-97	33.14747	-115.83335
ELS	33 38 49.1	-117 25 41.2	790	33.64698	-117.42812
EMS	32 44 21.2	-114 59 6.7	11	32.73921	-114.98521
ERP	32 44 35.2	-115 39 48.7	-42	32.74311	-115.66354
ESD	37 6 50.7	-117 39 59.4	855	37.11408	-117.66649
EV04	37 8 36.9	-118 0 59.4	2016	37.14358	-118.01649
EV1A	37 11 45.2	-117 41 23.9	1459	37.19590	-117.68997
EV2A	37 16 44.8	-117 54 9.9	1093	37.27911	-117.90275
EV3A	37 10 17.0	-117 49 29.2	915	37.17139	-117.82476
EV3B	37 10 17.0	-117 49 28.5	921	37.17139	-117.82459
EV5B	37 10 34.9	-117 47 25.2	888	37.17636	-117.79034
EWC	33 56 14.1	-116 22 55.8	466	33.93724	-116.38216
EWCE	33 56 14.1	-116 22 55.8	466	33.93724	-116.38216
EWCI	33 56 14.1	-116 22 55.7	466	33.93725	-116.38214
EWCJ	33 56 14.1	-116 22 55.7	466	33.93725	-116.38214
EWCK	33 56 14.1	-116 22 55.7	466	33.93725	-116.38214
EWCN	33 56 14.1	-116 22 55.8	466	33.93724	-116.38216
EWCV	33 56 14.1	-116 22 55.8	466	33.93724	-116.38216
EWCZ	33 56 14.1	-116 22 55.8	466	33.93724	-116.38216
FIL	34 25 24.1	-118 50 7.1	205	34.42335	-118.83531
FLA	33 52 17.3	-117 58 35.3	-441	33.87148	-117.97646
FLAE	33 52 17.3	-117 58 35.3	-441	33.87148	-117.97646
FLAM	33 52 17.3	-117 58 35.3	-441	33.87148	-117.97646
FLAN	33 52 17.3	-117 58 35.3	-441	33.87148	-117.97646
FLAZ	33 52 17.3	-117 58 35.3	-441	33.87148	-117.97646
FLS	34 58 13.3	-117 2 20.7	990	34.97036	-117.03909
FLSI	34 58 13.3	-117 2 20.7	990	34.97036	-117.03909
FLSJ	34 58 13.3	-117 2 20.7	990	34.97036	-117.03909
FLSK	34 58 13.3	-117 2 20.7	990	34.97036	-117.03909
FMA	33 43 5.8	-118 17 5.5	-10	33.71828	-118.28485
FORA	34 5 18.2	-116 55 13.9	1596	34.08839	-116.92053
FOX	34 44 39.5	-118 13 57.2	683	34.74431	-118.23255
FRK	33 24 7.5	-115 38 18.0	60	33.40209	-115.63835
FTC	34 52 17.4	-118 54 0.7	986	34.87151	-118.90020
GAV	34 1 20.9	-117 30 17.7	262	34.02248	-117.50492
GAVE	34 1 20.9	-117 30 17.7	262	34.02248	-117.50492
GAVN	34 1 20.9	-117 30 17.7	262	34.02248	-117.50492
GAVV	34 1 20.9	-117 30 17.7	262	34.02248	-117.50492
GAVZ	34 1 20.9	-117 30 17.7	262	34.02248	-117.50492
GFP	34 7 53.9	-118 19 11.2	339	34.13165	-118.31978
GFPE	34 7 53.9	-118 19 11.2	339	34.13165	-118.31978
GFPM	34 7 53.9	-118 19 11.2	339	34.13165	-118.31978
GFPN	34 7 53.9	-118 19 11.2	339	34.13165	-118.31978
GFPZ	34 7 53.9	-118 19 11.2	339	34.13165	-118.31978
GLA	33 3 3.8	-114 49 40.0	514	33.05107	-114.82779
GLAE	33 3 3.8	-114 49 40.0	514	33.05107	-114.82779
GLAN	33 3 3.8	-114 49 40.0	514	33.05107	-114.82779
GRAC	34 16 0.5	-116 23 17.4	913	34.26680	-116.38818
GRAV	34 11 13.2	-116 43 11.3	2454	34.18700	-116.71979
GRP	34 48 17.3	-115 36 25.4	978	34.80481	-115.60705
GSA	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSAA	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSAB	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSAC	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSAE	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSAI	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
GSAJ	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSAK	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSAN	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSAV	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSAZ	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSC	35 18 6.3	-116 48 20.6	954	35.30176	-116.80572
GSF	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSFE	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSFN	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSFZ	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GST	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSTE	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSTN	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSTV	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GSTZ	34 8 12.4	-118 7 41.9	195	34.13677	-118.12830
GTM	34 17 40.6	-116 21 21.6	836	34.29460	-116.35600
GVF	34 2 59.0	-118 7 11.8	141	34.04972	-118.11995
GVFE	34 2 59.0	-118 7 11.8	141	34.04972	-118.11995
GVFN	34 2 59.0	-118 7 11.8	141	34.04972	-118.11995
GVFZ	34 2 59.0	-118 7 11.8	141	34.04972	-118.11995
GVR	34 2 59.0	-118 7 11.8	141	34.04972	-118.11995
GVRE	34 2 59.0	-118 7 11.8	141	34.04972	-118.11995
GVRI	34 2 58.9	-118 7 11.9	141	34.04970	-118.11997
GVRJ	34 2 58.9	-118 7 11.9	141	34.04970	-118.11997
GVRK	34 2 58.9	-118 7 11.9	141	34.04970	-118.11997
GVRN	34 2 59.0	-118 7 11.8	141	34.04972	-118.11995
HAY	33 42 26.5	-115 38 20.1	413	33.70736	-115.63892
HCM	33 59 38.5	-118 23 2.6	19	33.99404	-118.38406
HOD	34 50 19.9	-117 14 51.1	807	34.83886	-117.24753
HOT	33 18 51.8	-116 34 56.5	1934	33.31440	-116.58236
HWS	36 6 18.3	-117 45 42.4	1411	36.10508	-117.76177
HYS	34 51 55.2	-117 34 11.1	833	34.86532	-117.56975
IKP	32 39 0.4	-116 6 34.1	906	32.65012	-116.10948
IND	33 49 0.2	-116 13 49.4	324	33.81672	-116.23040
INDE	33 49 0.2	-116 13 49.4	324	33.81673	-116.23040
INDN	33 49 0.2	-116 13 49.4	324	33.81673	-116.23040
ING	32 59 19.2	-115 18 36.9	-33	32.98865	-115.31024
IPAS	34 8 54.4	-118 10 16.2	257	34.14844	-118.17117
IPC	33 58 13.7	-118 20 6.9	23	33.97048	-118.33525
IPCE	33 58 13.7	-118 20 6.9	23	33.97048	-118.33525
IPCN	33 58 13.7	-118 20 6.9	23	33.97048	-118.33525
IPCZ	33 58 13.7	-118 20 6.9	23	33.97048	-118.33525
IR2	34 23 17.1	-118 23 59.0	562	34.38807	-118.39972
IRC	34 23 18.6	-118 24 11.0	533	34.38851	-118.40304
IRS	33 11 27.1	-115 25 44.5	-43	33.19086	-115.42904
ISA	35 39 46.0	-118 28 26.5	817	35.66278	-118.47403
ISA	35 39 46.0	-118 28 26.5	817	35.66278	-118.47403
ISAE	35 39 46.0	-118 28 26.5	817	35.66278	-118.47403
ISAN	35 39 46.0	-118 28 26.5	817	35.66278	-118.47403
JAW	35 18 56.8	-118 2 43.7	711	35.31578	-118.04546
JFS	35 21 5.6	-117 40 22.5	1393	35.35157	-117.67291
JNH	34 26 52.6	-117 57 25.4	1289	34.44795	-117.95705
JUL	33 2 53.4	-116 36 48.9	1260	33.04817	-116.61357
KEE	33 38 18.8	-116 39 15.3	1359	33.63856	-116.65425
KYP	34 6 4.3	-118 52 48.6	686	34.10120	-118.88017
LAN	34 43 36.6	-118 3 6.4	684	34.72683	-118.05177
LAQ	33 37 40.7	-116 16 49.9	-4	33.62798	-116.28051
LAV	34 45 57.5	-116 17 19.7	814	34.76597	-116.28880
LCL	33 50 24.0	-118 11 42.8	-110	33.83999	-118.19521
LCL	33 50 24.0	-118 11 42.8	-110	33.83999	-118.19521
LCLE	33 50 24.0	-118 11 42.8	-110	33.83999	-118.19521
LCLN	33 50 24.0	-118 11 42.8	-110	33.83999	-118.19521
LCLZ	33 50 24.0	-118 11 42.8	-110	33.83999	-118.19521
LEO	34 37 50.3	-118 18 18.2	1025	34.63064	-118.30505
LHU	34 40 15.3	-118 24 45.3	1000	34.67092	-118.41259
LJB	34 35 27.3	-117 50 56.0	861	34.59092	-117.84890
LJBE	34 35 27.3	-117 50 56.0	861	34.59092	-117.84890
LJBN	34 35 27.3	-117 50 56.0	861	34.59092	-117.84890
LJBV	34 35 27.3	-117 50 56.0	861	34.59092	-117.84890
LJBZ	34 35 27.3	-117 50 56.0	861	34.59092	-117.84890
LLA	34 29 7.1	-117 50 47.3	981	34.48532	-117.84648

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
LLN	34 29 7.1	-117 50 47.3	981	34.48532	-117.84648
LNA	33 47 17.2	-118 3 0.2	-95	33.78811	-118.05007
LNAE	33 47 17.2	-118 2 60.0	-28	33.78811	-118.05000
LNAN	33 47 17.2	-118 2 60.0	-28	33.78811	-118.05000
LNAZ	33 47 17.2	-118 2 60.0	-28	33.78811	-118.05000
LOK	34 43 28.0	-119 5 34.1	1538	34.72444	-119.09279
LOM	33 47 44.4	-118 16 48.5	-202	33.79567	-118.28013
LOR	37 9 13.2	-118 2 31.1	2234	37.15365	-118.04197
LRL	35 28 45.9	-117 40 55.6	1315	35.47942	-117.68211
LRLI	35 28 45.9	-117 40 55.6	1315	35.47942	-117.68211
LRLJ	35 28 45.9	-117 40 55.6	1315	35.47942	-117.68211
LRLK	35 28 45.9	-117 40 55.6	1315	35.47942	-117.68211
LRM	35 28 38.5	-117 41 24.0	1222	35.47737	-117.69000
LRR	34 31 34.6	-118 1 43.2	880	34.52629	-118.02867
LTC	33 29 37.6	-115 4 37.2	275	33.49378	-115.07700
LUC	34 27 17.1	-116 57 53.0	855	34.45476	-116.96474
LVA2	33 21 5.8	-116 33 41.6	1435	33.35160	-116.56155
MAM	37 14 10.2	-117 56 51.2	1662	37.23616	-117.94754
MAR	35 0 9.3	-119 20 24.8	411	35.00260	-119.34022
MDA	33 54 49.7	-117 0 2.4	820	33.91380	-117.00067
MIR	33 24 58.4	-116 4 54.1	30	33.41621	-116.08171
MLA	37 37 48.5	-118 50 10.0	2134	37.63014	-118.83611
MLL	34 5 28.5	-116 56 13.7	1480	34.09125	-116.93713
MSH	34 1 8.1	-118 17 27.1	16	34.01893	-118.29087
MSHE	34 1 8.1	-118 17 27.1	16	34.01893	-118.29087
MSHN	34 1 8.1	-118 17 27.1	16	34.01893	-118.29087
MSHZ	34 1 8.1	-118 17 27.1	16	34.01893	-118.29087
MWC	34 13 25.2	-118 3 29.8	1696	34.22368	-118.05827
NEE	34 49 29.4	-114 35 57.9	139	34.82482	-114.59942
NMC	35 50 31.9	-117 54 22.2	923	35.84220	-117.90616
NW2	33 5 14.4	-115 41 33.6	-100	33.08732	-115.69266
OLY	33 25 53.1	-117 7 5.0	446	33.43142	-117.11806
PAS	34 8 54.4	-118 10 16.2	257	34.14844	-118.17117
PAS1	34 8 54.4	-118 10 16.1	257	34.14844	-118.17113
PAS2	34 8 54.4	-118 10 16.1	257	34.14844	-118.17113
PAS3	34 8 54.4	-118 10 16.1	257	34.14844	-118.17113
PASE	34 8 54.4	-118 10 16.2	257	34.14844	-118.17117
PASL	34 8 54.4	-118 10 16.2	257	34.14844	-118.17117
PASN	34 8 54.4	-118 10 16.2	257	34.14844	-118.17117
PCF	34 3 10.9	-117 47 29.2	226	34.05304	-117.79144
PEC	33 53 31.1	-117 9 40.9	582	33.89198	-117.16135
PEM	34 10 0.8	-117 52 12.3	777	34.16689	-117.87009
PEMV	34 10 0.8	-117 52 12.3	777	34.16689	-117.87009
PEMZ	34 10 0.8	-117 52 12.3	777	34.16689	-117.87009
PFO	33 36 41.4	-116 27 33.7	1245	33.61151	-116.45935
PKM	34 53 44.0	-119 49 15.0	1673	34.89556	-119.82084
PLE	34 58 6.8	-119 4 8.4	1050	34.96857	-119.06899
PLM	33 21 13.0	-116 51 45.5	1660	33.35361	-116.86265
PLME	33 21 13.0	-116 51 45.5	1660	33.35361	-116.86265
PLMN	33 21 13.0	-116 51 45.5	1660	33.35361	-116.86265
PLS	33 47 43.1	-117 36 32.6	1181	33.79530	-117.60906
PLSE	33 47 43.1	-117 36 32.6	1181	33.79530	-117.60906
PLSI	33 47 43.1	-117 36 32.6	1181	33.79530	-117.60906
PLSJ	33 47 43.1	-117 36 32.6	1181	33.79530	-117.60906
PLSK	33 47 43.1	-117 36 32.6	1181	33.79530	-117.60906
PLSN	33 47 43.1	-117 36 32.6	1181	33.79530	-117.60906
PLT	32 43 52.4	-114 43 48.4	26	32.73123	-114.73012
POB	33 41 13.2	-116 55 26.5	974	33.68699	-116.92402
POBV	33 41 13.2	-116 55 26.4	974	33.68700	-116.92399
POBZ	33 41 13.2	-116 55 26.4	974	33.68700	-116.92399
PSP	33 47 37.3	-116 32 58.8	162	33.79371	-116.54968
PTD	34 0 16.0	-118 48 24.7	7	34.00443	-118.80686
PVEP	33 44 35.8	-118 24 15.3	69	33.74329	-118.40424
PVP	33 47 21.8	-118 24 7.2	202	33.78939	-118.40199
PVPE	33 47 21.8	-118 24 7.2	202	33.78939	-118.40199
PVPN	33 47 21.8	-118 24 7.2	202	33.78939	-118.40199
PVPZ	33 47 21.8	-118 24 7.2	109	33.78939	-118.40199
PVR	33 45 8.5	-118 22 18.2	153	33.75237	-118.37171
PYR	34 34 4.2	-118 44 30.8	1209	34.56784	-118.74190
QAL	34 44 56.7	-118 42 54.6	1232	34.74909	-118.71518
RAY	34 2 15.0	-116 48 47.0	2369	34.03749	-116.81306

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
RAYE	34 2 15.0	-116 48 47.0	2369	34.03749	-116.81306
RAYN	34 2 15.0	-116 48 47.0	2369	34.03749	-116.81306
RAYV	34 2 15.0	-116 48 47.0	2369	34.03749	-116.81306
RAYZ	34 2 15.0	-116 48 47.0	2369	34.03749	-116.81306
RCP	33 46 38.3	-118 8 0.4	-32	33.77731	-118.13343
RCP1	33 46 38.3	-118 8 0.4	-32	33.77730	-118.13345
RCP2	33 46 38.3	-118 8 0.4	-117	33.77730	-118.13345
RCPE	33 46 38.3	-118 8 0.4	-26	33.77731	-118.13343
RCPN	33 46 38.3	-118 8 0.4	-26	33.77731	-118.13343
RCPZ	33 46 38.3	-118 8 0.4	-26	33.77731	-118.13343
RCW	35 56 56.3	-117 38 52.3	930	35.94896	-117.64787
RMM	34 38 37.8	-116 37 27.8	1777	34.64384	-116.62438
RMME	34 38 37.8	-116 37 27.8	1777	34.64384	-116.62438
RMMI	34 38 37.8	-116 37 27.8	1777	34.64384	-116.62438
RMMJ	34 38 37.8	-116 37 27.8	1777	34.64384	-116.62438
RMMK	34 38 37.8	-116 37 27.8	1777	34.64384	-116.62438
RMMN	34 38 37.8	-116 37 27.8	1777	34.64384	-116.62438
RMMZ	34 38 37.8	-116 37 27.8	1777	34.64384	-116.62438
RMR	34 12 46.2	-116 34 34.7	1663	34.21283	-116.57630
RPV	33 44 35.8	-118 24 15.3	64	33.74329	-118.40426
RUN	32 58 20.0	-114 58 41.1	116	32.97222	-114.97809
RVC	36 0 28.2	-117 53 26.0	1039	36.00783	-117.89056
RVR	33 59 36.6	-117 22 31.6	232	33.99351	-117.37545
RYS	34 38 36.3	-119 21 8.0	1807	34.64341	-119.35224
SAD	34 4 51.1	-118 39 55.9	715	34.08087	-118.66554
SAT	33 42 28.7	-117 53 29.2	-420	33.70796	-117.89143
SATM	33 42 28.7	-117 53 29.2	-420	33.70796	-117.89143
SBB	34 41 17.4	-117 49 30.0	796	34.68817	-117.82501
SBC	34 26 26.7	-119 42 53.7	61	34.44076	-119.71492
SBCC	34 56 27.4	-120 10 22.7	565	34.94094	-120.17297
SBCD	34 22 6.3	-119 20 40.8	183	34.36841	-119.34467
SBCE	34 26 26.7	-119 42 53.7	61	34.44076	-119.71492
SBCN	34 26 26.7	-119 42 53.7	61	34.44076	-119.71492
SBK	35 4 44.9	-117 34 58.3	851	35.07914	-117.58287
SBLC	34 29 45.3	-119 42 51.7	1164	34.49593	-119.71435
SBLG	34 6 34.1	-119 3 53.9	381	34.10946	-119.06496
SBLP	34 33 12.7	-120 23 53.5	113	34.55353	-120.39819
SBP	34 13 56.5	-117 14 5.6	1843	34.23236	-117.23488
SBPI	34 13 56.5	-117 14 5.6	1843	34.23236	-117.23488
SBPJ	34 13 56.5	-117 14 5.6	1843	34.23236	-117.23488
SBPK	34 13 56.5	-117 14 5.6	1843	34.23236	-117.23488
SBPZ	34 13 56.5	-117 14 5.6	1843	34.23236	-117.23488
SBSC	33 59 43.7	-119 38 6.5	413	33.99546	-119.63513
SBSN	33 14 41.8	-119 30 26.5	217	33.24494	-119.50737
SC1	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC1E	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC1N	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC1V	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC2	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC2E	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC2N	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC2V	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC3	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC3E	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC3N	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SC3V	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SCC	34 56 27.4	-120 10 22.7	565	34.94094	-120.17297
SCD	34 22 6.3	-119 20 40.8	183	34.36841	-119.34467
SCI	32 58 45.1	-118 32 49.1	178	32.97919	-118.54698
SCIE	32 58 45.1	-118 32 49.1	178	32.97919	-118.54698
SCIN	32 58 45.1	-118 32 49.1	178	32.97919	-118.54698
SCR	34 6 23.3	-118 27 19.2	250	34.10647	-118.45533
SCS	34 1 9.0	-118 17 9.5	17	34.01916	-118.28598
SCY	34 6 23.3	-118 27 19.2	250	34.10647	-118.45533
SDL	35 22 35.5	-117 53 18.2	638	35.37652	-117.88838
SDW	34 36 34.3	-117 4 33.4	1125	34.60953	-117.07593
SEV	37 12 51.0	-117 45 57.0	945	37.21416	-117.76583
SGL	32 38 57.6	-115 43 35.0	75	32.64933	-115.72638
SIL	34 20 52.9	-116 49 38.9	1698	34.34802	-116.82746
SILV	34 20 52.9	-116 49 38.9	1698	34.34802	-116.82746
SILZ	34 20 52.9	-116 49 38.9	1698	34.34802	-116.82746

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
SIM	35 21 0.6	-119 59 47.4	579	35.35016	-119.99650
SIP	34 12 16.3	-118 46 50.6	694	34.20453	-118.78073
SKY	33 46 32.7	-117 6 25.6	774	33.77575	-117.10712
SLC	34 29 45.3	-119 42 51.7	1164	34.49593	-119.71435
SLG	34 6 34.1	-119 3 53.9	381	34.10946	-119.06496
SLP	34 33 12.7	-120 23 53.5	113	34.55353	-120.39819
SLT	33 15 53.6	-115 55 27.1	-83	33.26488	-115.92420
SME	33 49 22.4	-117 21 22.4	466	33.82288	-117.35623
SMO	33 32 8.2	-116 27 44.6	2403	33.53561	-116.46239
SMT	32 56 56.1	-115 43 13.1	3	32.94892	-115.72031
SNC	35 8 33.5	-118 18 10.3	1294	35.14264	-118.30286
SND	35 8 33.5	-118 18 10.3	1294	35.14264	-118.30286
SNR	32 51 42.6	-115 26 9.7	-63	32.86184	-115.43602
SNRE	32 51 42.6	-115 26 9.7	-63	32.86184	-115.43602
SNRN	32 51 42.6	-115 26 9.7	-63	32.86184	-115.43602
SNRZ	32 51 42.6	-115 26 9.7	-63	32.86184	-115.43602
SNS	33 25 56.6	-117 33 1.7	117	33.43239	-117.55047
SRT	35 41 32.5	-117 45 1.8	667	35.69235	-117.75051
SS2	34 12 26.4	-117 30 1.4	1574	34.20734	-117.50039
SS2E	34 12 26.4	-117 30 1.4	1574	34.20734	-117.50039
SS2N	34 12 26.4	-117 30 1.4	1574	34.20734	-117.50039
SSC	33 59 43.7	-119 38 6.5	413	33.99546	-119.63513
SSCE	33 59 43.7	-119 38 6.5	413	33.99546	-119.63513
SSCN	33 59 43.7	-119 38 6.5	413	33.99546	-119.63513
SSN	33 14 41.8	-119 30 26.5	217	33.24494	-119.50737
STO	34 41 31.2	-117 7 2.2	1145	34.69199	-117.11727
STOE	34 41 31.2	-117 7 2.1	1145	34.69201	-117.11726
STOI	34 41 31.2	-117 7 2.1	1145	34.69201	-117.11726
STOJ	34 41 31.2	-117 7 2.1	1145	34.69201	-117.11726
STOK	34 41 31.2	-117 7 2.1	1145	34.69201	-117.11726
STON	34 41 31.2	-117 7 2.1	1145	34.69201	-117.11726
STOZ	34 41 31.2	-117 7 2.1	1145	34.69199	-117.11726
STT	34 47 20.5	-118 27 49.0	796	34.78904	-118.46361
SUN	34 12 37.7	-117 41 38.2	1652	34.21048	-117.69394
SUP	32 57 19.3	-115 49 31.7	177	32.95537	-115.82547
SVD	34 6 23.2	-117 5 53.7	574	34.10645	-117.09825
SWM	34 42 57.8	-118 35 1.0	1184	34.71605	-118.58362
SYP	34 31 40.1	-119 58 42.0	1253	34.52780	-119.97834
SYS	32 34 45.7	-116 54 53.5	181	32.57936	-116.91486
TAB	34 22 56.8	-117 40 54.9	2250	34.38245	-117.68191
TABZ	34 22 56.8	-117 40 54.9	2250	34.38245	-117.68191
TCC	33 59 40.7	-118 0 50.3	195	33.99465	-118.01397
TCCJ	33 59 40.7	-118 0 50.3	195	33.99465	-118.01397
TCCN	33 59 40.7	-118 0 50.3	195	33.99465	-118.01397
TEJ	35 13 51.9	-118 41 19.6	844	35.23107	-118.68878
THC	34 54 30.7	-118 39 51.9	1688	34.90853	-118.66443
TIN	37 3 15.2	-118 13 48.3	1164	37.05422	-118.23009
TINE	37 3 15.2	-118 13 48.3	1164	37.05422	-118.23009
TINN	37 3 15.2	-118 13 48.3	1164	37.05422	-118.23009
TJR	35 1 38.0	-118 44 37.4	398	35.02722	-118.74373
TMB	35 5 12.9	-119 32 7.7	988	35.08693	-119.53548
TOW	35 48 31.9	-117 45 53.7	653	35.80885	-117.76493
TPC	34 6 20.3	-116 2 57.8	686	34.10564	-116.04939
TPO	34 52 43.8	-118 13 43.1	769	34.87883	-118.22864
TPR	34 5 34.3	-118 35 16.1	335	34.09285	-118.58780
TPRM	34 5 34.3	-118 35 16.1	335	34.09285	-118.58780
TWL	34 16 41.8	-118 35 43.7	352	34.27827	-118.59548
TWLE	34 16 41.8	-118 35 43.7	352	34.27827	-118.59548
TWLN	34 16 41.8	-118 35 43.7	352	34.27827	-118.59548
UPL	34 8 53.4	-117 41 57.8	516	34.14817	-117.69940
UPLE	34 8 53.4	-117 41 57.8	516	34.14817	-117.69940
UPLI	34 8 53.4	-117 41 57.8	516	34.14817	-117.69940
UPLJ	34 8 53.4	-117 41 57.8	516	34.14817	-117.69940
UPLK	34 8 53.4	-117 41 57.8	516	34.14817	-117.69940
UPLN	34 8 53.4	-117 41 57.8	516	34.14817	-117.69940
UPLZ	34 8 53.4	-117 41 57.8	516	34.14817	-117.69940
USC	34 1 9.0	-118 17 9.5	17	34.01916	-118.28597
VET	34 17 48.4	-118 1 42.0	1757	34.29678	-118.02833
VETE	34 17 48.4	-118 1 42.0	1757	34.29678	-118.02833
VETI	34 17 48.4	-118 1 42.0	1757	34.29678	-118.02833
VETJ	34 17 48.4	-118 1 42.0	1757	34.29678	-118.02833

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
VETK	34 17 48.4	-118 1 42.0	1757	34.29678	-118.02833
VETN	34 17 48.4	-118 1 42.0	1757	34.29678	-118.02833
VETZ	34 17 48.4	-118 1 42.0	1757	34.29678	-118.02833
VG2	33 49 57.1	-116 48 37.5	1465	33.83254	-116.81041
VPD	33 48 57.5	-117 45 48.2	147	33.81596	-117.76338
VPE	35 56 58.0	-117 49 2.1	1435	35.94945	-117.81724
VST	33 9 21.1	-117 13 55.2	76	33.15585	-117.23200
VTV	34 33 38.1	-117 19 46.6	812	34.56058	-117.32961
WAS	35 44 15.7	-118 33 26.8	1828	35.73770	-118.55743
WBM	35 36 30.2	-117 53 25.8	892	35.60839	-117.89049
WBS	35 32 12.2	-118 8 25.3	1902	35.53671	-118.14035
WCH	35 52 43.9	-118 4 26.6	2461	35.87887	-118.07405
WCH1	35 52 43.9	-118 4 26.6	2461	35.87887	-118.07405
WCS	36 1 37.3	-117 46 3.4	1135	36.02702	-117.76761
WCX	35 42 41.6	-117 35 40.1	654	35.71155	-117.59448
WHF	35 41 42.5	-118 21 6.6	859	35.69513	-118.35183
WHS	36 6 18.3	-117 45 42.4	1411	36.10508	-117.76177
WHV	35 30 35.6	-118 31 8.6	971	35.50989	-118.51904
WHV1	35 30 35.6	-118 31 8.6	971	35.50989	-118.51904
WI2	33 16 34.1	-115 34 53.6	-97	33.27614	-115.58154
WI2E	33 16 34.1	-115 34 53.6	-97	33.27614	-115.58154
WIN	33 40 58.8	-117 6 13.2	600	33.68299	-117.10366
WIS	33 16 33.1	-115 35 43.4	-102	33.27586	-115.59540
WISE	33 16 33.0	-115 35 43.5	-102	33.27583	-115.59542
WJP	35 24 39.4	-118 28 55.0	1090	35.41094	-118.48196
WLH	36 9 8.8	-118 18 47.2	2645	36.15243	-118.31312
WLH1	36 9 8.8	-118 18 47.2	2645	36.15243	-118.31312
WLK	33 3 4.8	-115 29 30.9	-82	33.05135	-115.49193
WMF	36 7 3.9	-117 51 17.4	1513	36.11774	-117.85484
WNM	35 50 31.9	-117 54 22.2	923	35.84220	-117.90616
WOF	35 32 7.6	-118 42 48.7	1306	35.53545	-118.71352
WOR	35 41 44.3	-118 14 32.9	795	35.69563	-118.24246
WOR1	35 41 44.3	-118 14 32.9	795	35.69563	-118.24246
WRC	35 56 56.3	-117 38 52.3	930	35.94896	-117.64787
WRV	36 0 28.2	-117 53 26.0	1039	36.00783	-117.89056
WRV1	36 0 28.2	-117 53 26.0	1039	36.00783	-117.89056
WRVE	36 0 28.2	-117 53 26.0	1039	36.00783	-117.89056
WRVJ	36 0 28.2	-117 53 26.0	1039	36.00783	-117.89056
WRVK	36 0 28.2	-117 53 26.0	1039	36.00783	-117.89056
WRVN	36 0 28.2	-117 53 26.0	1039	36.00783	-117.89056
WSC	35 42 15.5	-117 53 15.0	853	35.70429	-117.88751
WSH	35 35 58.6	-117 29 33.5	764	35.59962	-117.49265
WSP	34 35 46.3	-118 34 47.0	1188	34.59618	-118.57972
WVP	35 56 58.0	-117 49 2.1	1435	35.94945	-117.81724
WWP	35 44 8.0	-118 5 17.0	1117	35.73556	-118.08806
WWR	33 59 24.3	-116 39 20.9	655	33.99007	-116.65580
XMS	35 31 23.3	-117 21 51.0	667	35.52314	-117.36418
XTL	34 17 45.5	-117 51 44.0	1643	34.29597	-117.86223
YAQ	33 9 59.8	-116 21 13.9	430	33.16661	-116.35386
YEG	35 26 11.7	-119 57 36.3	907	35.43658	-119.96009
YMD	32 33 14.2	-114 33 12.7	39	32.55395	-114.55352
YUH	32 38 50.2	-115 55 21.1	158	32.64729	-115.92253

Non-Surveyed Stations:

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
AMR	36 23 52.1	-116 28 30.0	677	36.39782	-116.47499
AMS	33 8 29.1	-115 15 17.7	91	33.14140	-115.25493
BAC	33 36 43.8	-117 2 26.3	551	33.61220	-117.04060
BAL	34 18 24.1	-118 58 2.3	299	34.30670	-118.96730
BBC	34 14 30.1	-116 54 32.9	2016	34.24170	-116.90914
BCK	32 43 29.7	-115 2 41.1	-6	32.72492	-115.04475
BCM	33 39 19.4	-115 26 55.6	1087	33.65539	-115.44877
BHM	34 16 43.9	-116 36 57.5	1806	34.27886	-116.61597
BLC	34 14 36.0	-118 40 24.2	671	34.24330	-118.67340
BMM	33 45 24.2	-114 35 11.1	516	33.75673	-114.58642
BNP	37 59 18.4	-118 18 9.2	2401	37.98844	-118.30256
BPK	34 7 29.0	-114 12 37.5	457	34.12472	-114.21041

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
BRH	34 23 31.8	-119 27 1.3	100	34.39217	-119.45038
BSC	32 43 29.7	-115 2 41.1	-6	32.72492	-115.04475
CAM	34 15 16.3	-119 2 3.1	222	34.25451	-119.03419
CBX	32 18 49.5	-116 39 49.6	1203	32.31376	-116.66378
CCM	33 25 45.2	-115 27 55.6	440	33.42923	-115.46543
CFW	36 12 29.9	-117 54 16.9	1332	36.20831	-117.90469
CGS	36 11 24.5	-117 37 26.5	1634	36.19015	-117.62402
CH2	33 17 46.5	-115 20 12.9	298	33.29624	-115.33693
CHL	34 19 58.3	-118 1 25.8	1541	34.33286	-118.02383
CHM	34 33 10.9	-114 34 21.9	647	34.55304	-114.57275
CIS	33 24 24.2	-118 24 15.0	436	33.40671	-118.40417
CISF	33 24 24.2	-118 24 15.0	436	33.40671	-118.40417
CKC	34 8 10.9	-117 10 31.7	506	34.13636	-117.17548
CMB	38 2 5.7	-120 23 9.4	-36	38.03492	-120.38594
CMH	34 33 10.9	-114 34 21.9	647	34.55304	-114.57275
COQ	33 51 37.9	-117 30 37.8	205	33.86054	-117.51049
COT	33 18 17.6	-115 21 14.7	244	33.30490	-115.35409
COX	33 52 21.2	-115 19 43.6	837	33.87255	-115.32877
CPBX	32 25 3.9	-115 18 17.1	130	32.41776	-115.30475
CPT	33 18 12.2	-117 20 26.9	14	33.30339	-117.34081
CPX	32 25 3.9	-115 18 17.1	-49	32.41776	-115.30475
CRS	34 14 36.1	-117 15 44.9	1386	34.24336	-117.26248
DAH	32 44 4.5	-115 33 30.9	-42	32.73458	-115.55859
DBB	33 44 0.1	-117 5 52.7	627	33.73337	-117.09798
DCA	34 18 43.2	-119 33 44.0	-120	34.31201	-119.56221
DCC	34 18 34.2	-119 39 24.2	-126	34.30951	-119.65672
DCE	34 22 0.0	-119 37 24.2	-90	34.36667	-119.62338
DHS	33 55 35.0	-116 23 10.7	396	33.92638	-116.38629
DHSE	33 55 34.9	-116 23 10.7	396	33.92637	-116.38629
DHSN	33 55 34.9	-116 23 10.7	396	33.92637	-116.38629
DHSV	33 55 34.9	-116 23 10.7	396	33.92637	-116.38629
DHSZ	33 55 34.9	-116 23 10.7	396	33.92637	-116.38629
DLT	34 10 12.1	-117 48 39.0	478	34.17003	-117.81083
DR2	33 40 59.0	-117 6 14.3	532	33.68305	-117.10398
DR2E	33 40 59.0	-117 6 14.3	532	33.68305	-117.10398
DR2N	33 40 59.0	-117 6 14.3	532	33.68305	-117.10398
DR2Z	33 40 59.0	-117 6 14.3	532	33.68305	-117.10398
DSH	33 55 35.0	-116 23 10.7	396	33.92638	-116.38629
DTI	33 45 3.7	-118 13 18.0	-905	33.75104	-118.22167
DVL	34 11 59.5	-117 19 44.4	554	34.19986	-117.32899
EAG	33 50 56.6	-115 28 26.2	319	33.84905	-115.47394
ECBX	31 28 19.6	-115 3 6.9	-10	31.47212	-115.05190
ECC	32 47 54.3	-115 32 56.7	-64	32.79841	-115.54910
ECF	34 27 28.8	-119 5 29.5	956	34.45801	-119.09154
ECX	31 28 19.6	-115 3 6.9	-10	31.47212	-115.05190
EGX	31 42 37.0	-114 28 42.8	-51	31.71029	-114.47855
EMX	31 59 18.4	-115 14 35.1	-39	31.98844	-115.24308
ENX	31 53 0.4	-116 39 44.8	177	31.88343	-116.66245
ESG	33 54 58.9	-118 25 14.4	-74	33.91636	-118.42067
FAL	34 18 35.5	-117 48 36.0	2271	34.30985	-117.81000
FNK	33 22 59.0	-115 38 18.4	-36	33.38306	-115.63844
FRG	33 45 26.0	-116 3 44.2	887	33.75722	-116.06228
FRI	36 59 29.8	-119 42 33.3	78	36.99161	-119.70924
FTM	32 33 17.7	-114 20 3.2	213	32.55493	-114.33423
GAL	35 12 49.2	-117 45 19.8	936	35.21367	-117.75551
GMN	37 18 1.0	-117 15 37.9	2115	37.30029	-117.26052
GRH	34 18 31.8	-118 33 31.8	748	34.30880	-118.55880
GWV	36 11 11.9	-116 40 16.8	1497	36.18665	-116.67133
HAI	36 8 11.9	-117 56 51.1	1110	36.13664	-117.94753
HDG	34 25 43.9	-116 18 20.9	1302	34.42886	-116.30580
HID	34 25 43.9	-116 18 20.9	1302	34.42886	-116.30579
HMT	33 42 36.8	-117 0 14.9	485	33.71021	-117.00414
HSP	32 44 48.9	-115 33 45.3	-54	32.74691	-115.56259
INS	33 56 8.6	-116 11 42.4	1654	33.93572	-116.19512
IRN	34 9 36.2	-115 11 5.2	933	34.16005	-115.18476
JAS	37 56 47.7	-120 26 21.4	420	37.94659	-120.43927
JTR	33 48 50.6	-115 54 3.4	1325	33.81405	-115.90095
JUN	34 28 10.9	-117 52 43.2	1166	34.46969	-117.87867
KBY	33 2 24.9	-115 42 6.4	-99	33.04024	-115.70177
KRC	35 19 35.9	-119 44 45.2	-26	35.32665	-119.74590
LCH	37 14 4.6	-117 38 52.9	1415	37.23462	-117.64803

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
LCM	34 1 4.3	-118 17 16.2	85	34.01786	-118.28784
LED	34 28 3.7	-115 56 14.2	807	34.46770	-115.93729
LGA	32 45 35.1	-114 29 36.8	18	32.75976	-114.49356
LJC	32 51 48.2	-117 15 14.9	-39	32.86340	-117.25414
LOP	34 17 24.1	-117 29 24.0	957	34.29003	-117.48999
LOPV	34 17 24.1	-117 29 24.0	957	34.29003	-117.48999
LSM	36 44 17.9	-116 16 21.0	1104	36.73831	-116.27248
LTM	33 54 54.2	-114 55 8.7	696	33.91505	-114.91908
MEC	33 38 7.4	-116 1 45.4	448	33.63538	-116.02928
MGM	37 26 28.0	-117 29 49.9	2053	37.44112	-117.49719
MMI	37 25 11.8	-119 44 36.9	1256	37.41993	-119.74359
MNP	37 24 53.8	-119 43 45.3	961	37.41494	-119.72926
MNT	34 27 25.0	-118 26 39.9	701	34.45690	-118.44440
MON	34 8 11.5	-118 1 33.0	515	34.13652	-118.02584
MOV	34 9 21.1	-116 30 8.9	1194	34.15587	-116.50247
MRV	34 3 40.9	-116 32 37.7	936	34.06137	-116.54380
MTC	37 37 55.6	-118 57 57.8	2362	37.63210	-118.96607
MTCZ	37 37 53.8	-118 57 57.2	2362	37.63161	-118.96590
MTU	37 21 11.8	-118 33 51.8	1774	37.35328	-118.56439
MZP	37 42 1.6	-117 23 2.5	2336	37.70045	-117.38403
NHL	34 23 30.6	-118 35 55.2	544	34.39180	-118.59870
NMN	37 4 50.9	-116 49 7.8	1391	37.08080	-116.81884
NOP	36 7 40.8	-116 9 13.1	927	36.12799	-116.15364
NWR	33 6 6.3	-115 41 3.4	-117	33.10174	-115.68427
OAK	34 21 50.4	-118 47 0.3	822	34.36400	-118.78300
OBB	33 10 2.6	-115 38 14.8	-107	33.16740	-115.63744
ORC	33 33 58.4	-115 46 11.8	1039	33.56623	-115.76994
ORK	33 33 58.4	-115 46 11.8	1039	33.56623	-115.76994
ORV	39 33 20.0	-121 13 3.6	322	39.55555	-121.21766
PAD	35 38 21.5	-120 51 54.9	429	35.63929	-120.86526
PAR	36 14 56.8	-120 20 34.5	443	36.24912	-120.34292
PASP	34 8 57.1	-118 10 20.4	263	34.14919	-118.17234
PASS	34 8 57.1	-118 10 20.4	263	34.14919	-118.17234
PBI	35 9 40.7	-120 28 28.5	518	35.16131	-120.47458
PBX	31 44 10.6	-116 42 47.2	281	31.73627	-116.71311
PCR	36 5 37.6	-120 26 8.1	254	36.09379	-120.43559
PGE	36 20 55.7	-117 4 0.0	1807	36.34881	-117.06667
PGW	35 11 1.7	-120 37 40.5	105	35.18381	-120.62791
PHC	35 40 55.7	-121 9 12.4	472	35.68213	-121.15343
PIC	32 54 51.3	-114 38 38.1	213	32.91425	-114.64391
PIU	34 44 25.3	-115 5 41.2	1163	34.74036	-115.09477
PIV	35 54 23.3	-120 40 59.7	455	35.90646	-120.68326
PKL	34 26 50.4	-119 37 2.0	98	34.44734	-119.61721
PLP	34 8 57.1	-118 10 20.4	257	34.14919	-118.17234
PMC	35 43 28.7	-120 22 17.1	445	35.72464	-120.37141
PMCE	35 43 28.7	-120 22 17.1	445	35.72464	-120.37141
PMCN	35 43 28.7	-120 22 17.1	445	35.72464	-120.37141
PMCV	35 43 28.7	-120 22 17.1	445	35.72464	-120.37141
PMCZ	35 43 28.7	-120 22 17.1	445	35.72464	-120.37141
PMG	35 25 47.3	-120 31 16.5	486	35.42980	-120.52124
PNM	33 58 38.6	-115 48 5.8	1101	33.97738	-115.80161
PPB	35 15 37.7	-120 53 7.5	64	35.26047	-120.88542
PPK	37 25 34.6	-117 54 28.9	1791	37.42628	-117.90804
PPR	35 38 51.5	-120 42 5.7	237	35.64764	-120.70159
PPT	36 6 29.8	-120 43 19.5	465	36.10829	-120.72209
PRC	36 15 22.0	-120 37 15.3	581	36.25612	-120.62093
PRI	36 8 29.9	-120 39 57.3	1145	36.14162	-120.66593
PSA	36 1 31.0	-120 53 21.3	143	36.02529	-120.88926
PSH	35 35 26.9	-120 24 58.5	347	35.59080	-120.41624
PSM	36 4 10.7	-120 35 44.1	946	36.06963	-120.59559
PTQ	34 34 52.8	-120 34 20.7	434	34.58132	-120.57241
PTR	35 39 16.7	-120 12 43.5	600	35.65464	-120.21208
PVRF	33 45 30.1	-118 21 27.0	293	33.75836	-118.35751
RCH	34 18 26.5	-116 21 4.7	796	34.30736	-116.35130
RDM	34 24 0.1	-117 11 2.9	1382	34.40002	-117.18415
ROD	34 37 46.9	-116 36 20.3	1247	34.62969	-116.60564
RSE	32 55 32.1	-115 29 59.8	-90	32.92558	-115.49993
RVM	34 10 48.8	-114 12 3.9	196	34.18022	-114.20107
RVS	34 2 5.0	-114 31 7.5	629	34.03472	-114.51875
SAI	34 0 48.1	-119 26 16.9	66	34.01335	-119.43803
SBA	34 0 48.1	-119 26 16.9	66	34.01335	-119.43804

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
SBAI	34 0 48.1	-119 26 16.9	66	34.01335	-119.43804
SBI	33 28 49.3	-119 1 46.3	-48	33.48037	-119.02952
SBSM	34 2 14.4	-120 21 3.8	126	34.03734	-120.35106
SCIF	32 58 48.2	-118 32 51.0	170	32.98005	-118.54751
SHH	34 11 15.8	-115 39 19.0	1075	34.18771	-115.65528
SJQ	33 37 12.1	-117 50 45.0	118	33.62004	-117.84583
SJR	33 37 12.1	-117 50 45.0	118	33.62004	-117.84583
SLD	32 50 31.4	-117 16 7.7	2	32.84207	-117.26881
SLU	32 30 6.4	-114 46 41.0	-8	32.50176	-114.77807
SMF	34 1 16.8	-118 26 47.4	14	34.03000	-118.44650
SMX	31 41 17.2	-115 54 15.9	-46	31.68811	-115.90443
SNI	33 14 54.1	-119 31 27.1	227	33.24837	-119.52420
SOL	32 50 31.4	-117 15 42.5	74	32.84207	-117.26180
SPA	33 36 10.3	-118 10 32.4	-374	33.60287	-118.17567
SPB	33 33 11.6	-118 11 14.4	-374	33.55321	-118.18734
SPC	33 33 46.9	-118 8 25.2	-374	33.56304	-118.14033
SPM	34 28 19.3	-115 24 12.4	868	34.47204	-115.40344
SPX	31 2 42.5	-115 27 56.7	2751	31.04513	-115.46574
SSK	34 12 58.3	-117 41 22.2	1720	34.21619	-117.68950
SSM	34 2 14.4	-120 21 3.8	126	34.03734	-120.35106
SSV	34 13 1.3	-117 29 23.4	1550	34.21703	-117.48982
STP	34 34 16.3	-114 50 55.5	581	34.57121	-114.84876
SVP	37 42 53.8	-117 48 6.1	2582	37.71495	-117.80170
SXT	34 20 16.4	-119 12 53.4	488	34.33790	-119.21480
SYL	34 21 12.6	-118 26 58.8	1026	34.20350	-118.44970
TCN	33 59 36.1	-118 0 49.2	219	33.99336	-118.01366
THP	33 49 54.2	-116 20 20.3	1594	33.83172	-116.33896
THPE	33 49 54.2	-116 20 20.3	1594	33.83172	-116.33896
THPI	33 49 54.2	-116 20 20.3	1594	33.83172	-116.33896
THPJ	33 49 54.2	-116 20 20.3	1594	33.83172	-116.33896
THPK	33 49 54.2	-116 20 20.3	1594	33.83172	-116.33896
THPN	33 49 54.2	-116 20 20.3	1594	33.83172	-116.33896
THPZ	33 49 54.2	-116 20 20.3	1594	33.83172	-116.33896
THR	34 33 11.5	-117 43 9.0	980	34.55319	-117.71916
TM2	35 5 12.0	-119 32 6.2	902	35.08666	-119.53505
TMO	36 48 19.1	-117 24 31.9	2154	36.80530	-117.40885
TOP	33 31 26.6	-116 25 31.0	2611	33.52405	-116.42529
TOPI	33 31 26.6	-116 25 31.0	2611	33.52405	-116.42529
TOPJ	33 31 26.6	-116 25 31.0	2611	33.52405	-116.42529
TOPK	33 31 26.6	-116 25 31.0	2611	33.52405	-116.42529
TTM	34 20 7.3	-114 49 41.7	1051	34.33537	-114.82826
U06	32 57 57.9	-115 34 33.4	-48	32.96608	-115.57593
U08	33 2 2.1	-115 32 6.9	-48	33.03390	-115.53526
U1	33 4 19.5	-115 32 55.5	-107	33.07207	-115.54876
U12	33 7 30.3	-115 39 53.2	-117	33.12507	-115.66476
U13	33 10 59.7	-115 37 22.0	-48	33.18324	-115.62277
U14	33 10 8.7	-115 34 18.4	-107	33.16907	-115.57176
U15	33 7 44.7	-115 34 11.2	-107	33.12907	-115.56976
U16	33 8 38.7	-115 37 50.8	-111	33.14407	-115.63077
U2	33 4 30.3	-115 27 13.5	-87	33.07507	-115.45376
U3	33 0 32.7	-115 24 20.7	-77	33.00908	-115.40576
U4	32 57 32.7	-115 27 20.7	-82	32.95908	-115.45576
U6	32 57 54.3	-115 34 39.9	-77	32.96508	-115.57777
U7	33 3 21.9	-115 36 49.6	-104	33.05607	-115.61376
U8	33 2 6.3	-115 32 8.7	-102	33.03507	-115.53577
U9	33 0 50.7	-115 30 6.3	-96	33.01408	-115.50176
VEX	32 21 40.5	-115 6 21.9	-49	32.36126	-115.10608
VGR	33 50 15.2	-116 48 34.7	1455	33.83754	-116.80963
VRD	34 12 54.6	-118 16 43.8	902	34.21520	-118.27880
VTR	34 24 15.0	-119 42 57.8	53	34.40417	-119.71605
VTRE	34 24 15.0	-119 42 57.8	53	34.40417	-119.71605
VTRN	34 24 15.0	-119 42 57.8	53	34.40417	-119.71605
VVD	34 26 39.5	-118 39 47.9	600	34.44430	-118.66330
WCF	36 12 29.9	-117 54 16.9	1332	36.20831	-117.90469
WCO	35 37 20.9	-118 26 18.1	1567	35.62248	-118.43836
WCP	36 4 15.5	-117 51 3.7	1453	36.07098	-117.85102
WCPN	36 4 15.5	-117 51 3.7	1453	36.07098	-117.85102
WDY	35 41 59.9	-118 50 39.1	457	35.69998	-118.84421
WH2	34 18 52.4	-114 24 35.7	1198	34.31455	-114.40992
WHP	34 18 25.4	-114 29 47.7	559	34.30705	-114.49658
WKR	35 48 52.1	-120 30 43.5	461	35.81446	-120.51208

Station Code	Latitude (deg-min-sec)	Longitude (deg-min-sec)	Elevation (meters)	Latitude (dec. degrees)	Longitude (dec. degrees)
WKT	35 47 38.3	-118 26 36.1	849	35.79398	-118.44337
WKT1	35 47 38.3	-118 26 36.1	849	35.79398	-118.44337
WKT2	35 47 38.3	-118 26 36.1	849	35.79398	-118.44337
WML	33 0 54.9	-115 37 23.8	-92	33.01524	-115.62327

Appendix C

Instrument Response Values for Stations Recorded by SCSN

The table following lists instrument constants needed to compute the gain for all currently operating SCSN stations and those that are recorded from outside networks. Blanks indicate that the information was not available or that it does not apply. All short-period horizontal components are indicated by VLE, VLN, VHE, or VHN. All FBA's are labeled by ASZ, ASN, or ASE for the three components of acceleration. In some cases, the horizontal components of the older stations were never designated as high- or low-gain; in these cases, I have labeled the horizontal components as high-gain. Blanks indicate that the information was not available; in most cases this is because the site is maintained by another organization other than the USGS-Pasadena Office.

To obtain the absolute gain of each instrument, one has to include the following constants (*Stewart and O'Niel, 1980*). The digitizer gain for all instruments is 819.2 counts/volt (2048 counts/2.5 volts). The *VCO_type_val*is a value dependent on the VCO type as shown below the equation (this value was shown as 90.4 in the 1988 Network Bulletin (Wald *et al.*). The "X" at the end of a VCO type indicates that 24db should be added to the listed attenuation value. *Freq* is the seismometer frequency. *DP* is the damping constant. *GC* is the seismometer generator constant. *Atten* is the attenuation setting.

For short-period stations:

$$\textbf{GAIN=} \quad \textbf{GC} \times 10^{(VCO\_type\_val-\textbf{ATT})/20} \times \textbf{VCO Hz/VCO Volt} \times \textbf{Disc. Volt/Disc. Hz} \times 819.2$$

For FBA's:

$$\textbf{GAIN=} \quad \textbf{GC} \times \text{amplifier gain} \times \textbf{VCO Hz/VCO Volt} \times \textbf{Disc. Volt/Disc. Hz} \times 819.2$$

(amplifier gain=1.0 except for GSA AFX=16.0 and GSA ASX=0.5)

VCO Type	*VCO_type_val*
J1	91.3
J2	91.3
J3	91.3
J4	91.3
J5	93.6
J312	93.6
J412	93.6
J512	93.6

Station Code	Freq	DP	GC	VCO Type	VCO Hz	VCO Volt.	Atten	Disc. Type	Disc. Volt.	Disc. Hz
ABL	1.0	0.8	1.0	J512M	105.0	4.05	18	J120	2.2	125
ADL	1.0	0.8	1.0	J512M	105.0	4.05	30	J120	2.2	125
ARV	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
BAC	1.0	0.8	1.0	J512A	105.0	4.05	18	J120	2.2	125
BAC VLE	1.0	0.8	1.0	J512X	105.0	4.05	24	J120	2.2	125
BAC VLN	1.0	0.8	1.0	J512X	105.0	4.05	24	J120	2.2	125
BAL	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
BAT	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
BC3	1.0	0.8	1.0	J512A	105.0	4.05	12	J120	2.2	125
BCH	1.0	0.8	1.0	J512M	105.0	4.05	12	J120	2.2	125
BLC	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
BLK	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
BMT	1.0	0.8	1.0	J312D	105.0	4.05	6	J120	2.2	125
BNP	1.0	0.8	1.0					J120	2.2	125
BON	1.0	0.8	1.0	J412H	105.0	4.05	30	J120	2.2	125
BRG	1.0	0.8	1.0	J412H	105.0	4.05	6	J120	2.2	125
BTL	1.0	0.8	1.0	J512A	105.0	4.05	18	J120	2.2	125
CAL	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
CAV	1.0	0.8	1.0	J412H	105.0	4.05	6	J120	2.2	125
CBK	1.0	0.8	1.0	J512M	105.0	4.05	6	J120	2.2	125
CDY	1.0	0.8	1.0	J512M	105.0	4.05	12	J120	2.2	125
CFL	1.0	0.8	1.0	J512A	105.0	4.05	6	J120	2.5	125
CFT	1.0	0.8	1.0	J512A	105.0	4.05	30	J120	2.2	125
CIS	1.0	0.8	0.5	J412M	105.0	4.05	24	J120	2.2	125
CIW VLZ	1.0	0.7	1.0	KIN			30	J120	2.2	125

Station Code	Freq	DP	GC	VCO Type	VCO Hz	VCO Volt.	Atten	Disc. Type	Disc. Volt.	Disc. Hz
CJV	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
CLC	1.0	0.8	3.3	USGS			0	J120	2.2	125
CLI	1.0	0.8	1.0	J512A	105.0	4.05	36	J120	2.2	125
CLI VHE	1.0	0.8	1.0	J512M	105.0	4.05	42	J120	2.2	125
CLI VHN	1.0	0.8	1.0	J412H	105.0	4.05	42	J120	2.2	125
CMB								J120	2.2	125
CO2	1.0	0.8	1.0	J412H	105.0	4.05	6	J120	2.2	125
COA	1.0	0.8	1.0	J412H	105.0	4.05	24	J120	2.2	125
COK	1.0	0.8	1.0	J512M	105.0	4.05	30	J120	2.2	125
COY	1.0	0.8	1.0	J412H	105.0	4.05	6	J120	2.2	125
COY VLZ	1.0	0.8	1.0	J412HX	105.0	4.05	24	J120	2.2	125
CPE	1.0	0.8	3.3	CIT	105.0	12.00	14	J120	2.2	125
CPM	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
CPM VLZ	1.0	0.8	1.0	J412HX	105.0	4.05	24	J120	2.2	125
CRG	1.0	0.8	1.0	J512M	105.0	4.05	18	J120	2.2	125
CRR	1.0	0.8	1.0	J412H	105.0	4.05	18	J120	2.2	125
CSP								J120	2.2	125
CTW	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
CTW VLZ	1.0	0.8	1.0	J512MX	105.0	4.05	24	J120	2.2	125
CWC	1.0	0.8	16.0							125
DBM	1.0	0.8	1.0	J512M	105.0	4.05	12	J120	2.2	125
DH2 VLZ	4.5	0.7		OTS2				J120	2.2	125
DHB	1.0	0.9	2.9	OTS2			24	J120	2.2	125
DTP	1.0	0.8	1.0	J412H	105.0	4.05	6	J120	2.2	125
ECF	1.0	0.8	1.0	J512A	105.0	4.05	18	J120	2.2	125
EDW ASZ			5.0		125.0	1.25		J120	2.2	125
EDW ASN			5.0		125.0	1.25		J120	2.2	125
EDW ASE			5.0		125.0	1.25		J120	2.2	125
EDW VLZ	1.0	0.8	1.0	J412HX	105.0	4.05	24	J120	2.2	125
ELM	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
ELR	1.0	0.8	1.0	J512M	105.0	4.05	36	J120	2.2	125
ELS	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
EMS	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
ERP	1.0	0.8	1.0	J512A	105.0	4.05	30	J120	2.2	125
EWC	1.0	0.8	1.0	J412H	105.0	4.05	24	J120	2.2	125
EWC VHE	1.0	0.8	1.0	J512M	105.0	4.05	30	J120	2.2	125
EWC ASZ			2.5		125.0	0.63		J120	2.2	125
EWC ASN			2.5		125.0	0.63		J120	2.2	125
EWC ASE			2.5		125.0	0.63		J120	2.2	125
EWC VHN	1.0	0.8	1.0	J512M	105.0	4.05	30	J120	2.2	125
EWC VLE	1.0	0.8	1.0	J412HX	105.0	4.05	24	J120	2.2	125
FIL	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
FLS	1.0	0.8	1.0	J412H	105.0	4.05	24	J120	2.2	125
FLS ASZ			5.0		125.0	1.25		J120	2.2	125
FLS ASN			5.0		125.0	1.25		J120	2.2	125
FLS ASE			5.0		125.0	1.25		J120	2.2	125
FMA	1.0	0.9	2.9	DVEL	10	1	42			
FOX	1.0	0.8	1.0	J412H	105.0	4.05	30	J120	2.2	125
FRG	1.0	0.8	1.0	J512M	105.0	4.05	12	J120	2.2	125
FRI	1.0	0.8	1.0				24	J120	2.2	125
FRK	1.0	0.8	1.0	J512M	105.0	4.05	18	J120	2.2	125
FTC	1.0	0.8	1.0	J312D	105.0	4.05	30	J120	2.2	125
GAV	1.0	0.8	1.0	J512M	105.0	4.05	30	J120	2.2	125
GAV VLE	1.0	0.8	1.0	J512MX	105.0	4.05	24	J120	2.2	125
GAV VLN	1.0	0.8	1.0	J412HX	105.0	4.05	24	J120	2.2	125
GAV VLZ	1.0	0.8	1.0	J412HX	105.0	4.05	24	J120	2.2	125
GFP VLZ	1.0	0.9	2.9	KIN			36	J120	2.2	125
GLA	1.0	0.8	6.0	KIN	125.0	13.50	8	J120	2.2	125
GLA VLE	0.8	0.8	3.5	KIN	125.0	13.50	26	J120	2.2	125
GLA VLN	0.8	0.8	3.5	KIN	125.0	13.50	26	J120	2.2	125
GRH	1.0	0.8	1.0	J512B	105.0	4.05	30	J120	2.2	125
GRH VLE	1.0	0.8	1.0	J512HX	105.0	4.05	24	J120	2.2	125
GRH ASZ			5.0		125.0	1.25		J120	2.2	125
GRH ASN					125.0	1.25		J120	2.2	125
GRH ASE					125.0	1.25		J120	2.2	125

Station Code	Freq	DP	GC	VCO Type	VCO Hz	VCO Volt.	Atten	Disc. Type	Disc. Volt.	Disc. Hz
GRH VLN	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.2	125
GRH VLZ	1.0	0.8	1.0	J512B	105.0	4.05	48	J120	2.2	125
GRP	1.0	0.8	1.0	J412H	105.0	4.05	6	J120	2.2	125
GSA ASZ			2.5	GSP			+24			0
GSA ASN			2.5	GSP			+24			0
GSA ASE			2.5	GSP			+24			0
GSA VLE	1.0	0.8	1.0	J112X	105.0	4.05	36			125
GSA AFZ			2.5	GSP			-6			0
GSA AFN			2.5	GSP			-6			0
GSA AFE			2.5	GSP			-6			0
GSA VLN	1.0	0.8	1.0	J112X	105.0	4.05	36			125
GSA VLZ	1.0	0.8	1.0	J112X	105.0	4.05	36			125
GSC	1.0	0.8	16.0	CIT	115.0	13.20	2	J120	2.2	125
GTM	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
GVR	1.0	0.8	1.0	J412H	105.0	4.05	42	J120	2.2	125
GVR VLE	1.0	0.8	1.0	J412HX	105.0	4.05	30	J120	2.2	125
GVR ASZ			5.0		125.0	1.25	0	J120	2.2	125
GVR ASN			5.0		125.0	1.25	0	J120	2.2	125
GVR ASE			5.0		125.0	1.25	0	J120	2.2	125
GVR VLN	1.0	0.8	1.0	J412HX	105.0	4.05	30	J120	2.2	125
HAY	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
HMT	1.0	0.8	1.0	J512A	105.0	4.05	18	J120	2.5	125
HMT VLE	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.5	125
HMT VLN	1.0	0.8	1.0	J512MX	105.0	4.05	24	J120	2.5	125
HOD	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
HOT	1.0	0.8	1.0	J412H	105.0	4.05	6	J120	2.2	125
HYS	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
IKP	1.0	0.8	3.3	CIT	105.0	13.20	14	J120	2.2	125
IND	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
IND VLE	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.5	125
IND VLN	1.0	0.8	1.0	J412AX	105.0	4.05	24	J120	2.5	125
ING	1.0	0.8	1.0	J312D	105.0	4.05	36	J120	2.2	125
INS	1.0	0.8	1.0	J512M	105.0	4.05	12	J120	2.2	125
IR2	1.0	0.8	3.3	CIT	125.0		20	J120	2.5	125
IRS	1.0	0.8	1.0	J512M	105.0	4.05	30	J120	2.2	125
ISA	1.0	0.8	3.3	CIT	115.0	13.20	2	J120	2.2	125
ISA VHE	0.8	0.8	3.5	CIT	125.0	13.50	20	J120	2.2	125
ISA VHN	0.8	0.8	3.5	CIT	125.0	13.50	20	J120	2.2	125
JAW	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
JFS	1.0	0.8	1.0	J412H	105.0	4.05	18	J120	2.2	125
JNH	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
JUL	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.5	125
KEE	1.0	0.8	1.0	J512A	105.0	4.05	12	J120	2.2	125
LAQ	1.0	0.8	1.0	J512M	105.0	4.05	18	J120	2.2	125
LCL	2.0	0.7				2.20				
LCL VLE	2.0	0.7		DVEL		2.20	42			
LCL VLN	2.0	0.7		J412H		2.20	42			
LCL VLZ	2.0	0.7		J412H		2.20	42			
LEO	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
LHU	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
LJB	1.0	0.8	1.0	J312D	105.0	4.05	6	J120	2.2	125
LJB VHE	1.0	0.8	1.0	J312D	105.0	4.05	30	J120	2.2	125
LJB VHN	1.0	0.8	1.0	J312D	105.0	4.05	30	J120	2.2	125
LJB VLZ	1.0	0.8	1.0	J312DX	105.0	4.05	24	J120	2.2	125
LLN	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
LOK	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
LOM	1.0	0.9	2.9	DVEL			42	J120	2.2	125
LRL	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
LRL ASZ			5.0		125.0	1.25		J120	2.2	125
LRL ASN			5.0		125.0	1.25		J120	2.2	125
LRL ASE			5.0		125.0	1.25		J120	2.2	124
LRR	1.0	0.8	1.0	J312D	105.0	4.05	24	J120	2.2	125
LTC	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
LUC	1.0	0.8	1.0	J412H	105.0	4.05	36	J120	2.2	125
MAR	1.0	0.8	1.0	J512M	105.0	4.05	12	J120	2.2	125

Station Code	Freq	DP	GC	VCO Type	VCO Hz	VCO Volt.	Atten	Disc. Type	Disc. Volt.	Disc. Hz
MDA	1.0	0.8	1.0	J312D	105.0	4.05	24	J120	2.2	125
MEC	1.0	0.8	1.0	J512M	105.0	4.05	12	J120	2.2	125
MIR	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
MLL	1.0	0.8	1.0	J312D	105.0	4.05	24	J120	2.2	125
MMI								J120	2.2	125
MNT	1.0	0.8	1.0	J512A	105.0	4.05	18	J120	2.2	125
MTC VLZ	1.0	0.8	1.0					J120	2.2	125
MTU	1.0	0.8	1.0				24	J120	2.2	125
MWC	1.0	0.8	3.3	J512A	105.0	4.05	18	J120	2.2	125
NHL	1.0	0.8	1.0	J512B	105.0	4.05	24	J120	2.2	125
NHL VLE	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.2	125
NHL ASZ			5.0		125.0	1.25		J120	2.2	125
NHL ASN			5.0		125.0	1.25		J120	2.2	125
NHL ASE			5.0		125.0	1.25		J120	2.2	125
NHL VLN	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.2	125
NHL VLZ	1.0	0.8	1.0	J512B	105.0	4.05	48	J120	2.2	125
NW2	1.0	0.8	1.0	J512M	105.0	4.05	42	J120	2.2	125
OAK	1.0	0.8	1.0	J512A	105.0	4.05	30	J120	2.2	125
OAK VHE	1.0	0.8	1.0	J512A	105.0	4.05	48	J120	2.2	125
OAK VHN	1.0	0.8	1.0	J512A	105.0	4.05	48	J120	2.2	125
OLY	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
ORK	1.0	0.8	1.0	J512M	105.0	4.05	12	J120	2.2	125
ORV								J120	2.2	125
PAD	1.0	0.8	1.0				24			0
PAS	1.0	0.8	8.0		105.0			J120	2.2	125
PBI	1.0	0.8	1.0					J120	2.2	125
PCF	1.0	0.8	1.0	J312D	105.0	4.05	36	J120	2.2	125
PEC								J120	2.2	125
PEM	1.0	0.8	1.0	J412H	105.0	4.05	18	J120	2.2	125
PEM VLZ	1.0	0.8	1.0	J412HX	105.0	4.05	24	J120	2.2	125
PHC	1.0	0.8	1.0				24	J120	2.2	125
PKM	1.0	0.8	1.0	J512M	105.0	4.05	12	J120	2.2	125
PLE	1.0	0.8	1.0	J512M	105.0	4.05	30	J120	2.2	125
PLM	1.0	0.8	16.0	CIT	105.0	13.20	14	J120	2.2	125
PLS	1.0	0.8	1.0	J512A	105.0	4.05	30	J120	2.2	125
PLS VHE	1.0	0.8	1.0	J412H	105.0	4.05	36	J120	2.2	125
PLS ASZ			5.0		125.0	1.25		J120	2.2	125
PLS ASN			5.0		125.0	1.25		J120	2.2	125
PLS ASE			5.0		125.0	1.25		J120	2.2	125
PLS VHN	1.0	0.8	1.0	J412H	105.0	4.05	36	J120	2.2	125
PLT	1.0	0.8	1.0	J512A	105.0	4.05	12	J120	2.2	125
PMC	1.0	0.8	1.0							0
PMC VLE	1.0	0.8	1.0							0
PMC VLN	1.0	0.8	1.0							0
PMC VLZ	1.0	0.8	1.0				24			0
PMG	1.0	0.8	1.0				24	J120	2.2	125
PNM	1.0	0.8	1.0	J512A	105.0	4.05	12			0
POB	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
POB VLZ	1.0	0.8	1.0	J412HX	105.0	4.05	24	J120	2.2	125
PPB	1.0	0.8	1.0				24	J120	2.2	125
PPR	1.0	0.8	1.0				24	J120	2.2	125
PRI	1.0		0.2				24	J120	2.2	125
PSH	1.0	0.8	1.0				24	J120	2.2	125
PSM	1.0	0.8	1.0				24	J120	2.2	125
PSP	1.0	0.8	1.0	J312D	105.0	4.05	30	J120	2.2	125
PTD	1.0	0.8	1.0	J512A	105.0	4.05	36	J120	2.2	125
PTQ	1.0	0.8	1.0				24	J120	2.2	125
PTR	1.0	0.8	1.0				24			0
PVP VLZ	1.0	0.9	2.9	KIN			24	J120	2.2	125
PVR	1.0	0.8	1.0	J412H	105.0	4.05	30	J120	2.2	125
PYR								J120	2.2	125
QAL	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
RAY	1.0	0.8	1.0	J512B	105.0	4.05	12	J120	2.2	125
RAY VLZ	1.0	0.8	1.0	J512B	105.0	4.05	48	J120	2.2	125
RCP	1.0	0.9								

Station Code	Freq	DP	GC	VCO Type	VCO Hz	VCO Volt.	Atten	Disc. Type	Disc. Volt.	Disc. Hz
RCP VLE	1.0	0.9	1.0	DVEL		2.50	42			0
RCP VLN	1.0	0.9	1.0	DVEL		2.50	42			0
RCP VLZ	1.0	0.9		DVEL		2.50	42	J120	2.2	125
RMR	1.0	0.8	1.0	J512A	105.0	4.05	18	J120	2.2	125
RUN	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
RVR	1.0	0.8	16.0	CIT	105.0	13.20	8	J120	2.2	125
RYS	1.0	0.8	1.0	J512M	105.0	4.05	18	J120	2.2	125
SAD	1.0	0.8	1.0	J412H	105.0	4.05	18	J120	2.2	125
SAT	1.0	0.7	2.0	OTS2			24	J120	2.2	125
SBB	1.0	0.8	3.3	CIT	105.0	12.00	14	J120	2.2	125
SBI	1.0	0.9	2.9	DVEL			18	J120	2.2	125
SBK	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
SBP ASZ			5.0		125.0	1.25	0	J120	2.2	125
SBP ASN			5.0		125.0	1.25	0	J120	2.2	125
SBP ASE			5.0		125.0	1.25	0	J120	2.2	125
SBP VLZ	1.0	0.8	1.0	J312DX	105.0	4.05	24	J120	2.2	125
SC1			7.6	NONE	10			J120	2.2	125
SCC	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
SCD	1.0	0.8	1.0	J312D	105.0	4.05	24	J120	2.2	125
SCI	1.0	0.8	1.0	J412H	105.0	4.05	30	J120	2.2	125
SCI VLE	1.0	0.8	1.0	J412HX	105.0	4.05	18	J120	2.2	125
SCI VLN	1.0	0.8	1.0	J412HX	105.0	4.05	18	J120	2.2	125
SCY	1.0	0.8	0.5	USGS	125.0	12.50	24	J120	2.2	125
SGL	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
SHH	1.0	0.8	1.0	J512A	105.0	4.05	6	J120	2.2	125
SIL	1.0	0.8	1.0	J512M	105.0	4.05	18	J120	2.2	125
SIL VLZ	1.0	0.8	1.0	J412HX	105.0	4.05	24	J120	2.2	125
SIM	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
SIP	1.0	0.8	1.0	J5M	115.0	4.05	18	J120	2.2	125
SIP VLE	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.2	125
SIP VLN	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.2	125
SKY	1.0	0.8	1.0	J512A	105.0	4.05	18	J120	2.5	125
SLC	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
SLG	1.0	0.8	1.0	J412H	105.0	4.05	18	J120	2.2	125
SLP	1.0	0.8	1.0	J312D	105.0	4.05	24	J120	2.2	125
SME	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
SMF	1.0	0.8	1.0	J512B	105.0	4.05	30	J120	2.2	125
SMF VLE	1.0	0.8	1.0	J512AX	105.0	4.05	36	J120	2.2	125
SMF ASZ			5.0		125.0	1.25		J120	2.2	125
SMF ASN			5.0		125.0	1.25		J120	2.2	125
SMF ASE			5.0		125.0	1.25		J120	2.2	125
SMF VLN	1.0	0.8	1.0	J512AX	105.0	4.05	36	J120	2.2	125
SMF VLZ	1.0	0.8	1.0	J512B	105.0	4.05	48	J120	2.2	125
SND	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
SNR	1.0	0.8	1.0	J512M	105.0	4.05	36	J120	2.2	125
SNR VHE	1.0	0.8	1.0	J412H	105.0	4.05	36	J120	2.2	125
SNS	1.0	0.8	3.3	CIT	105.0	12.00	20	J120	2.2	125
SRT	1.0	0.8	1.0	J412H	10	2.70	24	J120	2.2	125
SS2	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
SSC	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
SSC VHE	1.0	0.8	1.0	J512A	105.0	4.05	36	J120	2.2	125
SSC VHN	1.0	0.8	1.0	J512A	105.0	4.05	36	J120	2.2	125
SSM	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
SSN	1.0	0.8	1.0	J412H	105.0	4.05	18	J120	2.2	125
STT	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
SUN	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
SUP	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
SWM	1.0	0.8	8.3	CIT	125.0	13.50	2	J120	2.2	125
SXT	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
SYL	1.0	0.8	1.0	J512B	105.0	4.05	18	J120	2.2	125
SYL VLE	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.2	125
SYL ASZ			5.0		125.0	1.25		J120	2.2	125
SYL ASN			5.0		125.0	1.25		J120	2.2	125
SYL ASE			5.0		125.0	1.25		J120	2.2	125
SYL VLN	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.2	125

Station Code	Freq	DP	GC	VCO Type	VCO Hz	VCO Volt.	Atten	Disc. Type	Disc. Volt.	Disc. Hz
SYL VLZ	1.0	0.8	1.0	J512B	105.0	4.05	48	J120	2.2	125
SYP	1.0	0.8	6.0	CIT	115.0	13.20	26	J120	2.2	125
TAB	1.0	0.8	1.0	J412H	105.0	4.05	24	J120	2.2	125
TAB VLZ	1.0	0.8	1.0	J512AX	105.0	4.05	30	J120	2.2	125
TCC	1.0	0.8	1.0	J312D	105.0	4.05	36	J120	2.2	125
TEJ	1.0	0.8	1.0	J412H	105.0	4.05	24	J120	2.2	125
THC	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
TJR	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
TM2	1.0	0.8	1.0	J512M	105.0	4.05	30	J120	2.2	125
TOP	1.0	0.8	1.0	J312D	105.0	4.05	30	J120	2.2	125
TOP ASZ			5.0		125.0	1.25		J120	2.2	125
TOP ASN			5.0		125.0	1.25		J120	2.2	125
TOP ASE			5.0		125.0	1.25		J120	2.2	125
TOW	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
TPC	1.0	0.8	1.0	J512M	105.0	4.05	6	J120	2.2	125
TPO	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
TPR	1.0			OTS2			24	J120	2.2	125
TWL	1.0	0.8	1.0	J512A	105.0	4.05	30	J120	2.2	125
VG2	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
VPD	1.0	0.8	1.0	J512M	105.0	4.05	24	J120	2.2	125
VRD	1.0	0.8	1.0	J512A	105.0	4.05	30	J120	2.2	125
VRD VLE	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.2	125
VRD ASZ			5.0		125.0	1.25		J120	2.2	125
VRD ASN			5.0		125.0	1.25		J120	2.2	125
VRD ASE			5.0		125.0	1.25		J120	2.2	125
VRD VLN	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.2	125
VRD VLZ	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.2	125
VST	1.0	0.8	3.3	CIT	105.0	12.00	14	J120	2.2	125
VVD	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
WAS	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
WBM	1.0	0.8	1.0	J312D	105.0	4.05	24	J120	2.2	125
WBS	1.0	0.8	1.0	J412H	105.0	4.05	18	J120	2.2	125
WCH	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
WCS	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
WHF	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
WHV	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
WI2	1.0	0.8	1.0	J512M	105.0	4.05	36	J120	2.2	125
WI2 VHE	1.0	0.8	1.0	J512A	105.0	4.05	48	J120	2.2	125
WIN	1.0	0.8	1.0	J512A	105.0	4.05	18	J120	2.5	125
WIN VLE	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.5	125
WIN VLN	1.0	0.8	1.0	J512AX	105.0	4.05	24	J120	2.5	125
WJP	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
WLH	1.0	0.8	1.0	J512M	105.0	4.05	18	J120	2.2	125
WMF	1.0	0.8	1.0	J412H	105.0	4.05	6	J120	2.2	125
WNM	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
WOF	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
WOR	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
WRC	1.0	0.8	1.0	J412H	105.0	4.05	6	J120	2.2	125
WRV	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
WSC	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
WSH	1.0	0.8	1.0	J312D	105.0	4.05	6	J120	2.2	125
WSP	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
WVP	1.0	0.8	1.0	J512M	105.0	4.05	18	J120	2.2	125
WWP	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
WWR	1.0	0.8	1.0	J512A	105.0	4.05	24	J120	2.2	125
XMS	1.0	0.8	1.0	J312D	105.0	4.05	12	J120	2.2	125
XTL	1.0	0.8	1.0	J512A	105.0	4.05	12	J120	2.5	125
YAQ	1.0	0.8	1.0	J412H	105.0	4.05	12	J120	2.2	125
YEG	1.0	0.8	1.0	J312D	105.0	4.05	18	J120	2.2	125
YMD	1.0	0.8	1.0	J512A	105.0	4.05	18	J120	2.2	125
YUH	1.0	0.8	1.0	J512A	105.0	4.05	6	J120	2.2	125

Appendix D

DAT Tape Archives

Local Earthquakes

DATE	TIME	LATITUDE	LONGITUDE	DEPTH	M_b	M_{sz}	M_L	LOCATION
28JUN91	14:43.55	34.3 N	118.0 W	11			5.8	SIERRA MADRE
05JUL91	17:41.55	34.5 N	118.6 W	10			4.0	SAN FERNANDO
06JUL91	22:54.39	34.2 N	118.0 W	10			4.0	SIERRA MADRE
04DEC91	07:10.57	33.1 N	116.8 W	6			4.2	JULIAN
04DEC91	08:17.03	34.2 N	117.1 W	6			4.0	BIG BEAR
20DEC91	10:38.29	35.6 N	117.4 W	6			4.0	GARLOCK
04MAY92	16:19.50	33.9 N	116.3 W	13			4.8	JOSHUA TREE
12MAY92	02:31.11	34.0 N	116.3 W	7			4.0	JOSHUA TREE
18MAY92	15:44.18	34.0 N	116.3 W	6			4.8	JOSHUA TREE
11JUN92	00:24.19	34.2 N	116.4 W	1			4.1	JOSHUA TREE
28JUN92	15:05.30	34.2 N	116.8 W	5			6.5	BIG BEAR
05JUL92	21:18.27	34.6 N	116.3 W	0			5.5	YUCCA VALLEY
11JUL92	18:14.16	35.2 N	118.1 W	11			5.5	MOJAVE
20JUL92	04:48.02	35.0 N	116.9 W	5			4.4	BARSTOW
20JUL92	13:13.19	35.0 N	116.9 W	0			4.5	BARSTOW
24JUL92	18:14.36	33.9 N	116.3 W	9			4.7	YUCCA VALLEY
25JUL92	04:32.00	33.9 N	116.3 W	6			4.7	YUCCA VALLEY
15SEP92	08:47.11	34.1 N	116.4 W	9			4.7	YUCCA VALLEY
11OCT92	12:38.13	34.9 N	116.8 W	3			4.5	BARSTOW
20OCT92	05:28.10	35.9 N	120.5 W	10			4.7	PARKFIELD
27NOV92	16:00.58	34.3 N	116.9 W	2			5.3	BIG BEAR
04DEC92	02:08.58	34.4 N	116.9 W	3			5.1	BIG BEAR
04DEC92	05:25.11	34.4 N	116.9 W	3			4.5	BIG BEAR
11FEB93	12:39.37	35.0 N	117.0 W	3			3.8	BARSTOW
04APR93	05:21.25	35.9 N	120.5 W	8	4.0		4.4	PARKFIELD
17MAY93	23:20.50	37.2 N	117.8 W	7			6.2	EUREKA VALLEY
17MAY93	23:25.36	37.2 N	117.9 W	5			4.3	EUREKA VALLEY
18MAY93	01:03.08	37.2 N	117.8 W	3			4.7	EUREKA VALLEY
18MAY93	01:51.18	37.2 N	117.8 W	0			4.8	EUREKA VALLEY
18MAY93	23:48.54	37.0 N	117.8 W	3			4.7	EUREKA VALLEY
18MAY93	23:57.41	37.0 N	117.8 W	5			4.5	EUREKA VALLEY
19MAY93	14:13.24	37.1 N	117.8 W	10			5.2	EUREKA VALLEY
28MAY93	04:47.39	35.1 N	119.1 W	6			5.2	WHEELER RIDGE
21AUG93	01:46.38	34.0 N	116.3 W	9			5.2	YUCCA VALLEY
26OCT93	09:24.07	35.0 N	116.7 W	10			4.0	FORT IRWIN
14NOV93	12:25.35	35.9 N	120.5 W	10			5.0	PARKFIELD

Teleseisms & Regionals

DATE	TIME	LATITUDE	LONGITUDE	DEPTH	M_b	M_s	M_L	LOCATION
23JAN91	01:12.31	52.0 N	178.9 E	116	5.9			RAT ISL
09FEB91	16:18.58	9.9 S	159.1 E	10	6.3			SOLOMON ISL
21FEB91	02:35.32	58.4 N	175.4 W	10	6.3			BERING SEA
22APR91	21:56.52	9.7 N	83.1 W	10	6.6	7.5		COSTA RICA
24APR91	19:13.01	9.6 N	83.6 W	10	5.7			COSTA RICA
29APR91	09:12.47	42.5 N	43.6 E	10	6.2			W. CAUCASUS
01MAY91	07:18.43	62.5 N	151.5 W	116	6.1			ALASKA
03MAY91	O2:14.17	28.1 N	139.6 E	459	6.0			BONIN ISL
07MAY91	13:09.29	39.4 N	144.8 E	10	6.4			HONSHU
21MAY91	11:00.21	7.5 S	126.6 E	31	6.2			BANDA SEA
24MAY91	20:50.55	16.5 S	70.7 W	125	6.3			PERU
30MAY91	13:17.44	54.5 N	161.6 W	47	6.2			ALASKA
03JUN91	05:05.19	40.0 S	74.6 W	33	5.7			CHILE
20JUN91	05:18.53	1.2 N	122.8 E	33	6.2	7.2		MINAHASSA PENIN
22JUN91	00:30.27	24.0 N	108.5 W	10	5.5	6.1		GULF OF CA
27JUN91	19:42.42	24.4 N	108.2 W	10	5.6			GULF OF CA
06JUL91	12:19.46	13.3 S	72.4 W	85	6.3			CUZCO PERU
13JUL91	02:50.15	42.1 N	125.6 W	10			6.7	OREGON
03AUG91	00:49.03	40.4 N	125.4 W	5	4.9		4.7	NORTHERN CA
14AUG91	12:53.28	54.3 N	169.3 W	299	5.7			FOX ISL
14AUG91	19:15.06	13.6 S	167.6 E	33	6.0	6.6		VANUATU ISL

DATE	TIME	LATITUDE	LONGITUDE	DEPTH	M_b	M_s	M_L	LOCATION
16AUG91	22:26.17	41.7 N	125.4 W	10	5.7		5.9	NORTHERN CA
17AUG91	19:29.40	40.2 N	124.3 W	12			6.0	NORTHERN CA
17AUG91	22:17.13	41.6 N	125.5 W	10	6.2	7.1	6.8	NORTHERN CA
22AUG91	13:18.13	23.6 S	179.9 W	533	5.3			FIJI ISL
17SEP91	21:10.29	35.8 N	121.3 W	9	5.2			SAN SIMEON
18SEP91	09:48.13	14.6 N	91.0 W	5	5.7			GUATEMALA
14OCT91	15:58.14	9.1 S	158.5 E	33	6.2	7.1		SOLOMON ISL
18OCT91	17:22.55	24.2 S	177.6 W	194	5.8			FIJI ISL
19OCT91	21:23.16	30.7 N	78.8 E	19	6.5	7.1		INDIA
25OCT91	10:39.03	43.2 N	144.4 E	111	5.7			HOKKAIDO
30OCT91	10:35.47	15.2 S	173.3 W	58	5.7			TONGA ISL
01NOV91	16:23.26	30.1 S	178.0 W	48	6.4			KERMADEC ISL
11NOV91	17:46.01	17.9 N	105.6 W	33	5.5			JALISCO
19NOV91	22:28.51	4.6 N	77.5 W	21	6.5			COLOMBIA
26NOV91	19:40.48	42.0 N	142.6 E	55	6.2			HOKKAIDO
03DEC91	17:54.36	31.7 N	115.9 W	5			5.3	BAJA CA
11DEC91	20:39.39	23.4 S	171.1 E	34	5.6	6.5		LOYALTY ISL
13DEC91	02:33.52	45.6 N	151.6 E	32	6.2			KURIL ISL
17DEC91	06:38.16	47.3 N	151.5 E	149	5.9			KURIL ISL
19DEC91	04:41.37	49.0 N	128.8 W	10	5.0			VANCOUVER ISL
19DEC91	04:44.08	49.0 N	128.8 W	10	5.2			VANCOUVER ISL
19DEC91	04:45.45	49.0 N	128.9 W	10	5.2			VANCOUVER ISL
04JAN92	00:56.58	66.8 N	94.5 W	10	5.3			NW TERRITORIES
20JAN92	13:37.04	28.0 N	139.3 E	512	5.8			BONIN ISL
22JAN92	01:06.55	38.5 N	140.4 E	116	5.5			HONSHU
13FEB92	01:29.16	15.9 S	166.3 E	24	6.1			VANUATU ISL
02MAR92	12:29.40	52.9 N	160.0 E	44	6.5			KAMCHATKA
03MAR92	01:18.33	14.3 S	167.1 E	158	5.8			VANUATU ISL
07MAR92	01:53.37	10.2 N	84.3 W	73	6.3			COSTA RICA
13MAR92	16:01.06	52.5 N	178.9 W	211	6.0			ANDREANOF ISL
13MAR92	17:18.40	39.7 N	39.6 E	28	6.2			TURKEY
20MAR92	17:16.24	13.7 N	90.9 W	61	5.1			GUATEMALA
20MAR92	18:45.01	56.3 S	26.9 W	33	6.0			SANDWICH ISL
27MAR92	13:24.04	52.9 N	173.9 W	182	5.3			ANDREANOF ISL
06APR92	13:54.40	50.7 N	130.3 W	10	6.0			VANCOUVER ISL
27APR92	08:29.54	12.2 N	87.1 W	76	5.2			NICARAGUA
01JUN92	13:51.21	36.6 N	141.2 E	50	5.3			HONSHU
01JUN92	18:29.15	28.2 N	134.2 E	33	5.7			BONIN ISL
01JUN92	18:29.20	29.7 N	140.7 E	134	5.5			HONSHU
02JUN92	20:03.19	16.2 S	92.7 E	10	5.6			INDIAN OCEAN
02JUN92	21:05.00	16.2 S	92.8 E	10	5.7			INDIAN OCEAN
03JUN92	06:10.56	51.2 N	178.8 E	33	5.8			RAT ISL
05JUN92	21:46.42	40.3 N	124.5 W	21			4.8	NORTHERN CA
06JUN92	21:40.42	1.1 N	124.0 E	25	5.8			MINAHASSA PENIN
09JUN92	14:45.02	1.1 N	124.2 E	33	5.6			MINAHASSA PENIN
15JUN92	02:48.56	24.0 N	95.9 E	16	5.7			MYANMAR
15JUN92	20:39.13	0.1 S	123.1 E	142	5.9			MINAHASSA PENIN
16JUN92	05:51.05	45.6 N	142.3 E	329	5.7			HOKKAIDO
24JUN92	12:11.26	51.5 N	173.4 W	33	5.7			ANDREANOF ISL
25JUN92	06:30.51	28.1 S	176.7 W	18	6.1			KERMADEC ISL
26JUN92	11:32.31	6.1 N	82.4 W	33	5.8			PANAMA
11JUL92	10:44.21	22.3 S	178.5 W	381	6.2			FIJI ISL
13JUL92	18:11.34	3.9 S	76.6 W	100	6.2			PERU
18JUL92	08:36.59	39.4 N	143.4 E	33	6.1			HONSHU
30AUG92	20:09.07	17.7 S	178.8 W	573	5.8			FIJI ISL
02SEP92	05:50.03	5.9 S	112.4 E	630	5.8			JAVA SEA
02SEP92	10:26.19	37.0 N	113.5 W	10	5.5			UTAH
02SEP92	16:50.45	10.5 N	86.8 W	8	5.4			COSTA RICA
09SEP92	13:08.55	76.2 N	7.2 E	24	5.7			SVALBARD
10SEP92	10:43.20	22.2 S	175.2 W	33		6.1		TONGA ISL
12SEP92	14:59.36	57.3 N	155.1 W	56	5.4			ALASKA
15SEP92	21:04.00	14.1 S	167.0 E	200	5.8			VANUATU ISL
17SEP92	07:02.42	44.5 N	129.5 W	10	5.3			OREGON
23SEP92	13:38.35	31.2 N	130.2 E	160	5.6			KYUSHU
26SEP92	22:15.57	1.2 N	128.8 E	33		6.6		HALMAHERA
30SEP92	05:34.00	51.2 N	178.0 W	33		6.5		ANDREANOF ISL
30SEP92	20:09.07	17.5 S	179.0 W	570	5.8			FIJI ISL
11OCT92	19:24.15	18.9 S	168.8 E	33		6.9		VANUATU ISL
11OCT92	23:20.34	50.4 N	153.3 E	280	5.5			KURIL ISL
12OCT92	13:09.57	29.9 N	31.0 E	10	5.9			EGYPT
15OCT92	22:37.06	14.2 S	166.6 E	33		6.8		VANUATU ISL
17OCT92	02:51.53	18.9 S	168.9 E	33		6.5		VANUATU ISL

DATE	TIME	LATITUDE	LONGITUDE	DEPTH	M_b	M_s	M_L	LOCATION
17OCT92	08:32.41	6.6 N	76.8 W	33		6.6		COLOMBIA
18OCT92	15:12.01	6.9 N	77.0 W	33		7.3		COLOMBIA
19OCT92	12:03.32	19.1 S	169.2 E	33		6.0		VANUATU ISL
21OCT92	12:11.15	6.6 S	143.7 E	33		6.2		PAPUA NEW GUINEA
22OCT92	09:04.24	30.3 S	177.1 W	33		6.6		KERMADEC ISL
22OCT92	23:08.30	29.6 S	177.2 W	33		6.4		KERMADEC ISL
23OCT92	13:04.41	5.1 S	152.4 E	33		6.7		PAPUA NEW GUINEA
23OCT92	21:24.36	9.4 S	122.7 E	33	5.9			SAVU SEA
30OCT92	02:49.49	30.0 N	138.9 E	400	5.9			HONSHU
31OCT92	14:34.26	2.2 S	141.1 E	33		6.4		PAPUA NEW GUINEA
31OCT92	14:46.27	2.1 S	140.9 E	33		6.2		PAPUA NEW GUINEA
01NOV92	09:36.43	28.6 S	69.1 W	110	5.6			CHILE-ARGENTINA
04NOV92	01:59.27	61.3 S	154.6 E	10		6.3		BALLENY ISL
04NOV92	18:13.16	14.1 S	167.4 E	33		6.4		VANUATU ISL
04NOV92	21:32.36	31.4 S	71.2 W	33		5.7		CHILE
05NOV92	19:53.25	5.0 S	152.3 E	33		6.1		PAPUA NEW GUINEA
06NOV92	19:08.08	37.8 N	27.0 E	10		6.1		TURKEY
12NOV92	20:41.05	36.5 N	70.8 E	200	5.6			HINDU KUSH
12NOV92	22:29.00	21.9 S	178.4 W	370	5.8			FIJI ISL
18NOV92	21:10.42	38.4 N	22.3 E	10	6.1			GREECE
21NOV92	05:07.24	36.1 N	22.3 E	70	5.9			GREECE
21NOV92	22:39.33	55.9 S	24.5 W	33		6.6		SANDWICH ISL
23NOV92	23:11.13	38.5 N	72.4 E	100	5.7			TAJIKISTAN
25NOV92	06:02.30	4.1 S	102.3 E	100	5.7			SUMATRA
28NOV92	03:13.36	31.2 S	71.8 W	33		6.2		CHILE
04DEC92	11:36.37	38.0 N	72.3 E	120	5.6			TAJIKISTAN
06DEC92	03:44.34	38.8 N	72.0 E	130	5.6			TAJIKISTAN
07DEC92	02:11.42	43.8 N	147.3 E	50	5.9			KURIL ISL
08DEC92	07:08.40	9.2 N	93.5 E	70	6.2			NICOBAR ISL
12DEC92	05:29.27	8.2 S	121.9 E	33		7.5		INDONESIA
14DEC92	02:52.07	52.1 N	178.6 E	130	5.5			RAT ISL
18DEC92	03:14.05	6.4 S	147.1 E	33		6.0		PAPUA NEW GUINEA
19DEC92	12:14.23	52.1 N	158.6 E	60	6.0			KAMCHATKA
20DEC92	20:52.42	6.5 S	130.3 E	33		7.1		BANDA SEA
21DEC92	06:13.38	52.4 N	179.0 E	110	5.7			RAT ISL
23DEC92	03:00.46	6.4 S	130.6 E	110	5.7			BANDA SEA
24DEC92	00:34.19	15.0 S	173.3 W	70		6.4		SAMOA
26DEC92	19:52.25	0.2 S	19.2 W	10	5.7	6.0		MID-ATLANTIC
26DEC92	22:11.04	43.9 N	128.0 W	10		5.2		OREGON
04JAN93	20:41.12	21.6 S	175.1 W	33		6.3		TONGA ISL
10JAN93	14:38.49	57.1 S	16.9 W	33		6.3		SANDWICH ISL
13JAN93	18:50.42	50.9 S	139.0 E	10		6.3		AUSTRALIA
16JAN93	06:29.33	36.9 N	121.6 W	10	4.7		5.3	CENTRAL CA
18JAN93	01:18.08	18.4 N	145.9 E	170	5.9			MARIANAS ISL
19JAN93	14:39.27	38.7 N	133.5 E	460	6.0			SEA OF JAPAN
20JAN93	02:30.56	3.1 N	97.7 E	80	6.2			SUMATRA
20JAN93	17:31.15	7.1 S	128.8 E	33	6.0			BANDA SEA
07FEB93	13:27.44	37.6 N	137.3 E	24	6.3			HONSHU
09FEB93	14:25.39	45.7 N	141.9 E	307	5.5			HOKKAIDO
10FEB93	10:53.14	7.7 S	105.4 E	97	5.5			JAWA
13FEB93	10:55.56	14.8 S	177.0 W	33	5.7	6.1		FIJI ISL
24FEB93	22:21.38	24.9 S	68.4 W	120	6.0			CHILE-ARGENTINA
01MAR93	01:39.20	3.8 S	138.3 E	30	6.1			IRIAN JAYA
05MAR93	08:20.54	28.6 N	113.2 W	10	5.6			BAJA CA
06MAR93	03:05.51	10.9 S	164.2 E	33		7.0		SANTA CRUZ ISL
06MAR93	05:50.03	10.6 S	163.5 E	33	5.5	6.0		SOLOMON ISL
06MAR93	10:02.09	26.3 S	177.6 W	33	5.8	6.7		FIJI ISL
06MAR93	11:30.30	12.1 N	87.6 W	60	5.6			NICARAGUA
06MAR93	16:26.58	11.0 S	163.5 E	33	5.6	6.6		SOLOMON ISL
09MAR93	01:29.14	55.6 S	147.4 E	10	5.5	6.1		MACQUARIE ISL
09MAR93	07:45.45	60.3 S	28.7 W	33	5.6	6.1		SANDWICH ISL
10MAR93	12:39.21	58.3 S	21.6 W	33	5.4	6.5		S. W. ATLANTIC
10MAR93	21:56.27	48.3 N	153.0 E	140	5.6			KURIL ISL
12MAR93	14:01.40	13.9 S	178.3 W	33	5.9	6.5		FIJI ISL
15MAR93	16:08.57	26.7 S	70.6 W	33	5.9	6.2		CHILE
20MAR93	14:52.02	29.1 N	87.2 E	22		6.0		XIZANG
21MAR93	05:04.59	17.7 S	178.8 W	590	6.2			FIJI ISL
25MAR93	13:34.37	45.1 N	122.4 W	30	5.6	5.4		WASHINGTON-ORE.
02APR93	01:56.31	17.7 S	177.1 W	362	5.5			FIJI ISL
02APR93	08:04.14	17.3 S	172.2 W	33	5.8			TONGA ISL
05APR93	04:00.02	58.6 S	22.5 W	33	6.1			SANDWICH ISL
13APR93	20:07.15	1.2 N	126.8 E	31	5.6			N. MOLUCCA SEA

DATE	TIME	LATITUDE	LONGITUDE	DEPTH	M_b	M_s	M_L	LOCATION
16APR93	14:08.40	17.4 S	178.9 W	570	6.0			FIJI ISL
17APR93	20:32.47	16.2 S	177.7 W	33	5.8	6.1		FIJI ISL
18APR93	09:16.31	11.2 S	76.6 W	90	6.1			PERU
18APR93	14:10.39	53.9 S	132.5 W	10	5.6	6.1		PACIFIC-ANTARCTIC
19APR93	21:01.51	4.0 N	128.3 E	70	6.1	6.7		HALMAHERA
20APR93	16:26.20	20.4 S	179.0 W	590	5.6			FIJI (beg. only)
24APR93	09:54.21	17.7 S	179.8 W	600	5.6			FIJI ISL
25APR93	09:29.50	35.6 N	112.1 W	10	4.9			ARIZONA
28APR93	02:46.12	58.9 S	26.4 W	112	5.4			SANDWICH ISL
29APR93	08:21.01	35.6 N	112.1 W	10	5.5	4.8		ARIZONA
02MAY93	11:26.58	56.2 S	24.0 W	33	6.2			SANDWICH ISL
02MAY93	15:26.03	21.1 S	175.9 W	123	5.7			TONGA ISL
06MAY93	13:03.18	8.3 S	71.3 W	580	5.8			BRAZIL
09MAY93	22:16.43	43.8 N	128.0 W	10	4.9			OREGON
11MAY93	18:26.48	7.8 N	126.6 E	33	6.1	6.6		MINDANAO
13MAY93	11:59.49	55.2 N	160.4 W	32	6.4			ALASKA
15MAY93	03:09.39	16.6 N	98.5 W	33	5.8			GUERRERO
15MAY93	03:12.33	17.0 N	98.3 W	33	6.0			GUERRERO
15MAY93	21:52.25	51.3 N	178.8 W	33	6.2			ANDREANOF ISL
16MAY93	21:44.50	15.2 S	173.5 W	33	6.2	6.8		TONGA ISL
17MAY93	16:02.55	5.2 S	151.9 E	33	5.8	6.4		PAPUA NEW GUINEA
18MAY93	10:19.38	19.8 N	122.5 E	214	6.1			PHILIPPINES
18MAY93	10:19.40	19.8 N	122.4 E	198	6.6			PHILIPPINES
24MAY93	23:51.22	23.2 S	66.6 W	238	6.2			ARGENTINA
24MAY93	23:51.30	23.2 S	66.7 W	238	6.6			ARGENTINA
25MAY93	02:13.45	13.5 S	167.1 E	191	5.6			VANUATU ISL
25MAY93	23:16.43	55.1 N	160.3 W	33	6.2			ALASKA
27MAY93	05:10.54	16.1 S	174.1 W	130	5.5			TONGA ISL
27MAY93	08:51.59	29.2 S	178.7 W	121	5.9			KERMADEC ISL
29MAY93	06:50.13	19.1 N	26.5 W	10	5.9	6.2		NORTH ATLANTIC
30MAY93	14:12.22	3.7 S	142.7 E	20	5.8			PAPUA NEW GUINEA
30MAY93	16:32.29	5.5 S	150.5 E	110	5.8			PAPUA NEW GUINEA
30MAY93	17:08.53	1.6 N	127.3 E	100	5.9			HALMAHERA
30MAY93	17:13.21	1.6 N	127.2 E	99	5.6			HALMAHERA
30MAY93	22:34.03	0.6 S	124.2 E	67	5.6			MOLUCCA SEA
01JUN93	22:15.45	41.9 N	126.8 W	10	4.2			NORTHERN CA
03JUN93	09:38.26	14.8 S	167.3 E	153	5.6			VANUATU ISL
04JUN93	10:49.35	3.7 N	128.3 E	33	5.9			HALMAHERA
05JUN93	01:24.53	45.7 N	96.3 W	10		4.2		MINNESOTA
06JUN93	13:23.28	15.7 N	146.6 E	68	5.8			MARIANAS ISL
08JUN93	12:57.50	19.4 N	155.2 W	10	5.3			HAWAII
08JUN93	13:03.38	51.2 N	157.8 E	81	6.4	7.3		KAMCHATKA
08JUN93	23:17.41	31.7 S	68.9 W	113	6.5			ARGENTINA
10JUN93	12:59.02	51.0 N	159.6 E	33	5.8			KAMCHATKA
12JUN93	05:45.24	10.7 S	162.7 E	33	5.5	6.0		SOLOMON ISL
12JUN93	07:02.00	5.5 S	148.0 E	160	5.7			PAPUA NEW GUINEA
12JUN93	11:15.05	13.0 N	87.5 W	220	5.6			NICARAGUA
12JUN93	18:26.46	4.3 S	135.4 E	33	5.8	6.1		IRIAN JAYA
12JUN93	20:33.26	51.2 N	157.8 E	50	6.1			KAMCHATKA
13JUN93	00:39.11	6.3 S	155.5 E	194	5.4			SOLOMON ISL
15JUN93	13:06.34	5.0 S	145.4 E	222	5.4			PAPUA NEW GUINEA
18JUN93	11:52.38	28.4 S	177.2 W	33	6.2	6.8		KERMADEC ISL
18JUN93	17:38.31	28.4 S	176.9 W	33	5.4	6.1		KERMADEC ISL
18JUN93	17:57.50	28.3 S	177.1 W	20	5.9	6.7		KERMADEC ISL
18JUN93	19:34.40	28.5 S	176.8 W	33	5.2	6.0		KERMADEC ISL
30JUN93	23:47.36	21.1 S	173.1 E	33	5.8	6.7		VANUATU ISL
05JUL93	15:20.58	30.2 N	138.8 E	419	5.2			HONSHU
06JUL93	02:53.04	24.4 S	111.7 W	10	5.5	6.1		EASTER ISL
08JUL93	02:05.21	30.2 N	114.1 W	10			4.5	GULF OF CA
08JUL93	02:25.13	30.1 N	114.1 W	10			4.8	GULF OF CA
08JUL93	03:07.00	30.0 N	114.1 W	10			4.7	GULF OF CA
08JUL93	18:22.19	20.5 S	172.4 E	33	5.4	6.0		VANUATU ISL
08JUL93	22:06.16	24.0 S	68.7 W	106	5.3			CHILE-ARGENTINA
09JUL93	15:37.55	17.8 S	177.5 W	412	5.9			FIJI ISL
11JUL93	13:36.19	24.5 S	70.1 W	60	6.2			CHILE
11JUL93	20:09.38	23.2 S	68.0 W	133	5.4			CHILE
12JUL93	13:17.15	43.2 N	139.4 E	33	6.7	7.6		SEA OF JAPAN
12JUL93	14:04.27	43.6 N	139.5 E	33	5.5			SEA OF JAPAN
12JUL93	14:05.18	42.2 N	139.4 E	33	5.7			HOKKAIDO
12JUL93	14:45.07	43.5 N	139.4 E	33	6.0			SEA OF JAPAN
12JUL93	16:01.08	43.0 N	139.5 E	33		5.9		SEA OF JAPAN
17JUL93	23:56.36	6.1 S	113.0 E	564	5.3			JAWA

DATE	TIME	LATITUDE	LONGITUDE	DEPTH	Mb	Ms	ML	LOCATION
20JUL93	13:26.04	27.3 N	140.0 E	464	5.4			BONIN ISL
22JUL93	06:16.09	54.5 S	118.7 W	10	5.6	5.9		EAST PACIFIC RISE
22JUL93	12:15.35	21.8 N	144.1 E	130	5.6			MARIANAS ISL
23JUL93	11:50.07	36.4 N	70.4 E	277	5.3			HINDU KUSH
23JUL93	16:38.37	18.2 S	178.2 W	631	5.4			FIJI ISL
24JUL93	20:24.52	13.0 S	167.0 E	208	5.7			VANUATU ISL
28JUL93	18:07.49	5.5 S	153.9 E	33	5.5	6.0		SOLOMON ISL
03AUG93	07:20.00	51.4 N	130.5 W	10	5.5	6.0		QUEEN CHARLOTTE ISL
03AUG93	12:43.03	28.4 N	34.6 E	10	6.0			EGYPT
04AUG93	11:31.18	1.7 S	99.6 E	33	5.9	6.4		SUMATERA
04AUG93	19:05.05	5.3 S	145.7 E	101	5.4			PAPUA NEW GUINEA
05AUG93	12:42.43	18.0 S	178.4 W	616	5.5			FIJI ISL
07AUG93	00:00.39	26.8 N	125.6 E	160	6.0			TAIWAN
07AUG93	17:53.28	23.6 S	179.1 E	580	6.0			FIJI ISL
07AUG93	19:42.43	42.0 N	139.9 E	20	6.2			HOKKAIDO
08AUG93	08:34.22	13.3 N	144.0 E	50	7.2	8.1		MARIANAS ISL
09AUG93	11:38.32	36.4 N	70.7 E	230	5.8			HINDU KUSH
09AUG93	12:42.49	36.4 N	70.9 E	230	6.3			HINDU KUSH
10AUG93	00:51.53	45.2 S	167.0 E	33	6.2	7.1		NEW ZEALAND
10AUG93	09:46.36	38.4 S	177.5 E	12		6.1		NEW ZEALAND
11AUG93	05:48.20	37.5 N	118.9 W	5			4.7	MAMMOTH LAKES
11AUG93	22:33.03	37.3 N	121.7 W	10			4.8	SAN JOSE CA
13AUG93	11:02.21	36.3 S	178.6 E	110	5.8			NEW ZEALAND
16AUG93	04:33.56	13.5 N	145.0 E	60	5.8	6.0		MARIANAS ISL
19AUG93	04:31.08	1.9 N	127.5 E	124	5.4			HALMAHERA
20AUG93	05:06.55	5.9 S	142.5 E	33	6.0			PAPUA NEW GUINEA
21AUG93	09:42.36	21.0 S	178.2 W	430	5.8			FIJI ISL
26AUG93	03:32.42	5.5 S	154.2 E	136	5.5			SOLOMON ISL
28AUG93	20:14.45	6.6 N	94.8 E	130	5.8			NICOBAR ISL
29AUG93	09:57.49	6.9 S	129.8 E	99	5.7			BANDA SEA
31AUG93	06:55.28	41.9 N	49.7 E	33	5.2			CASPIAN SEA
01SEP93	11:48.42	4.2 S	102.7 E	100	5.8			SUMATERA
01SEP93	14:03.19	3.1 N	96.3 E	33	5.8	6.2		SUMATERA
02SEP93	14:07.09	2.4 N	128.6 E	233	5.3			HALMAHERA
03SEP93	12:35.01	14.5 N	92.8 W	33	5.8	6.8		CHIAPAS
04SEP93	08:30.56	16.1 S	176.8 W	389	5.5			FIJI ISL
04SEP93	11:38.39	36.4 N	70.8 E	199	5.9			HINDU KUSH
04SEP93	21:39.35	9.2 S	122.5 E	33	5.8			SAVU SEA
04SEP93	23:08.33	7.4 S	126.7 E	275	5.3			BANDA SEA
06SEP93	03:55.58	4.6 S	153.2 E	33	6.0	6.6		PAPUA NEW GUINEA
09SEP93	21:52.12	56.3 S	27.4 W	100	5.7			SANDWICH ISL
10SEP93	19:12.54	14.6 N	92.7 W	33	6.3	7.3		CHIAPAS
11SEP93	06:14.27	4.7 S	76.3 W	120	5.6			PERU
12SEP93	03:22.34	13.2 N	90.3 W	70	5.6			GUATEMALA
13SEP93	12:37.54	29.1 S	177.4 W	33	5.7	6.1		KERMADEC ISL
18SEP93	05:02.27	36.4 N	71.6 E	117	6.1			AFGHANISTAN
19SEP93	14:10.57	14.3 N	93.2 W	33	5.8	6.3		CHIAPAS
20SEP93	10:17.42	0.9 N	29.4 W	10	5.7			MID-ATLANTIC RIDGE
21SEP93	03:28.54	42.3 N	122.0 W	10			5.9	OREGON
21SEP93	04:16.12	42.3 N	122.0 W	5	4.4			OREGON
21SEP93	05:45.33	42.4 N	122.0 W	10			5.9	OREGON
21SEP93	06:14.43	42.4 N	122.0 W	5			4.8	OREGON
24SEP93	00:57.25	6.1 N	125.4 E	100	5.4			MINDANAO
26SEP93	03:31.22	10.8 N	138.5 E	33	6.1			CAROLINE ISL
26SEP93	11:55.53	13.0 N	145.0 E	73	5.8			MARIANAS ISL
27SEP93	13:37.33	53.7 S	52.2 W	33	6.1			SOUTH ATLANTIC
29SEP93	11:16.05	0.8 N	121.6 E	110	6.0			MINAHASSA PENIN
29SEP93	18:26.20	42.6 S	18.7 W	10	5.7			MID-ATLANTIC RIDGE
29SEP93	22:25.53	18.2 N	76.4 E	33	6.3			INDIA
02OCT93	08:42.35	38.1 N	88.7 E	33	6.2			XINJIANG
02OCT93	09:43.22	38.1 N	88.6 E	33	5.7			XINJIANG
02OCT93	16:01.58	3.0 S	147.7 E	33	5.1	5.9		ADMIRALTY ISL
05OCT93	05:09.49	6.4 S	129.7 E	33	5.9	6.1		BANDA SEA
08OCT93	18:23.37	46.0 N	150.0 E	100	5.4			KURIL ISL
11OCT93	07:19.45	36.6 N	121.2 W	6	4.1			NORTHERN CA
11OCT93	13:07.30	17.4 S	179.1 W	560	5.9			FIJI ISL
11OCT93	15:54.21	32.3 N	137.9 E	350	6.5			HONSHU
11OCT93	18:59.43	32.4 N	115.1 W	10			4.1	CA-BAJA CA
12OCT93	19:51.25	4.2 N	76.7 W	105	5.4			COLOMBIA
13OCT93	01:39.15	8.4 S	154.8 E	131	5.5			SOLOMON ISL
13OCT93	02:06.01	5.8 S	145.6 E	33	6.4	7.1		PAPUA NEW GUINEA
13OCT93	03:07.30	5.8 S	145.8 E	33	6.1	6.8		PAPUA NEW GUINEA

DATE	TIME	LATITUDE	LONGITUDE	DEPTH	M_b	M_s	M_L	LOCATION
13OCT93	05:50.41	5.8 S	145.6 E	33		5.9		PAPUA NEW GUINEA
13OCT93	11:59.31	24.1 N	108.8 W	10	4.3			GULF OF CA
18OCT93	21:49.48	32.3 N	118.8 W	5	4.4			CA/BAJA CA
21OCT93	14:37.11	36.2 N	118.0 W	5			4.1	CA-NEVADA
22OCT93	13:10.15	49.0 N	128.7 W	10	4.6			VANCOUVER ISL
23OCT93	18:45.58	40.4 N	126.4 W	23			5.2	NORTHERN CA
24OCT93	07:52.16	16.8 N	98.6 W	33	6.2	6.6		GUERRERO
25OCT93	10:07.10	5.9 S	146.0 E	10	5.7	6.0		PAPUA NEW GUINEA
25OCT93	10:27.05	5.6 S	145.9 E	33	6.4	7.1		PAPUA NEW GUINEA
25OCT93	11:59.45	5.8 S	146.0 E	10	5.7	6.2		PAPUA NEW GUINEA
26OCT93	11:38.26	38.5 N	98.8 E	33	5.8			QINGHAI
27OCT93	21:16.47	18.1 S	178.0 W	594	5.3			FIJI ISL
29OCT93	04:09.05	51.3 N	178.3 W	33	5.8			ANDREANOF ISL
30OCT93	17:59.06	31.1 S	68.2 W	110	5.9			ARGENTINA
31OCT93	17:02.53	4.6 N	125.7 E	176	5.3			TALAUD ISL
01NOV93	17:19.21	9.9 S	161.1 E	84	5.8			SOLOMON ISL
05NOV93	22:37.20	3.2 S	148.2 E	16	5.6	6.2		ADMIRALTY ISL
10NOV93	00:03.25	4.7 S	151.9 E	113	5.6			PAPUA NEW GUINEA
10NOV93	11:13.36	15.2 S	177.1 W	360	5.4			FIJI ISL
10NOV93	14:54.24	44.4 N	115.0 W	10			4.3	IDAHO
11NOV93	00:28.35	50.3 N	177.5 W	33	6.3			ANDREANOF ISL
13NOV93	00:16.48	16.3 N	98.6 W	19	5.8			GUERRERO
13NOV93	01:18.04	51.9 N	158.7 E	34	6.5	7.1		KAMCHATKA
13NOV93	12:30.55	16.1 S	70.6 W	120	5.5			PERU
14NOV93	01:59.23	21.9 S	68.7 W	110	5.8			CHILE-BOLIVIA
17NOV93	02:42.30	1.6 N	124.0 E	246	5.5			MINAHASSA PENIN
17NOV93	11:18.53	51.8 N	158.8 E	40	6.0			KAMCHATKA
18NOV93	13:07.48	2.4 N	126.6 E	33	5.0			MOLUCCA SEA
18NOV93	14:55.13	6.7 N	74.6 W	90	4.6			COLOMBIA
19NOV93	01:43.22	54.5 N	164.5 W	33	6.2			UNIMAK ISL
19NOV93	02:25.08	14.8 N	94.0 W	25	5.5			CHIAPAS
19NOV93	03:02.48	14.6 N	94.1 W	22	4.5			CHIAPAS
19NOV93	03:22.30	54.3 N	164.3 W	33	5.0			UNIMAK ISL
19NOV93	03:58.53	54.3 N	164.2 W	33	5.5			UNIMAK ISL
19NOV93	04:37.49	22.1 S	180.0 W	491	5.3			FIJI ISL
19NOV93	04:53.39	17.1 S	173.9 W	33	5.0			TONGA ISL
19NOV93	05:55.12	8.0 N	127.0 E	34	5.0			PHILIPPINE ISL
19NOV93	08:53.41	54.3 N	164.3 W	33	4.6			UNIMAK ISL
19NOV93	09:05.39	7.3 N	34.7 W	10	5.7			MID-ATLANTIC RIDGE
19NOV93	10:19.13	54.3 N	164.2 W	33	4.8			UNIMAK ISL
19NOV93	10:55.44	10.2 N	126.3 E	41	5.2			PHILIPPINE ISL
19NOV93	14:40.39	54.3 N	164.3 W	33	4.8			UNIMAK ISL
20NOV93	01:14.28	54.3 N	164.2 W	33	4.6			UNIMAK ISL
20NOV93	11:54.02	54.3 N	164.2 W	33	5.4			UNIMAK ISL
20NOV93	11:58.40	51.9 N	158.4 E	33	5.2			KAMCHATKA
20NOV93	19:24.53	60.0 N	153.1 W	120	5.5			ALASKA
21NOV93	00:16.00	35.9 S	102.9 W	10	5.3			S. PACIFIC
21NOV93	08:57.46	52.9 N	175.8 W	218	4.6			ANDREANOF ISL
21NOV93	17:29.55	22.8 S	171.4 E	33	5.2			LOYALTY ISL
22NOV93	03:01.03	5.8 N	126.8 E	100	5.8			MINDANAO
22NOV93	04:16.45	50.8 N	156.6 E	33	5.3			KURIL ISL
22NOV93	22:34.03	10.4 N	126.4 E	69	5.0			PHILIPPINE ISL
22NOV93	22:43.25	11.5 N	86.2 W	110	5.5			NICARAGUA
23NOV93	15:02.12	6.4 N	125.8 E	154	5.2			MINDANAO
23NOV93	20:07.39	41.3 N	142.8 E	46	5.2			HOKKAIDO
24NOV93	02:40.17	2.4 S	141.1 E	33	5.2			PAPUA NEW GUINEA
24NOV93	05:49.53	27.2 S	176.6 W	33	5.3			KERMADEC ISL
24NOV93	06:19.50	15.3 N	105.1 W	10	4.7			MICHOACAN
24NOV93	11:27.20	21.3 S	174.3 W	35	5.3			TONGA ISL
25NOV93	08:31.14	22.0 S	170.1 E	33	5.7			LOYALTY ISL
25NOV93	20:24.02	1.2 S	13.4 W	20	5.7			ASCENSION ISL
25NOV93	21:45.25	12.2 N	125.7 E	33	5.2			PHILIPPINE ISL
26NOV93	09:03.49	12.4 N	86.6 W	149	4.7			NICARAGUA
26NOV93	10:53.36	2.2 N	127.0 E	68	5.1			MOLUCCA
26NOV93	21:12.31	3.4 S	129.8 E	33	5.0			SERAM
26NOV93	22:20.38	6.8 N	73.1 W	148	4.6			COLOMBIA
26NOV93	23:20.07	9.0 S	157.6 E	33	5.8	6.2		SOLOMON ISL
27NOV93	06:11.23	38.5 N	141.2 E	108	6.0			HONSHU
27NOV93	22:25.15	25.2 S	180.0 E	523	5.3			FIJI ISL
28NOV93	10:50.26	5.6 S	110.3 E	565	5.6			JAVA SEA
28NOV93	12:40.48	3.8 S	128.7 E	129	5.2			SERAM
28NOV93	20:59.27	36.5 N	71.3 E	108	5.1			AFGHANISTAN

DATE	TIME	LATITUDE	LONGITUDE	DEPTH	Mb	Ms	ML	LOCATION
29NOV93	06:35.24	20.8 S	174.1 W	35	5.2			TONGA ISL
29NOV93	07:32.05	0.1 S	123.0 E	145	5.2			MINAHASSA PENIN
29NOV93	20:28.43	10.3 N	126.5 E	33	5.6			PHILIPPINE ISL
30NOV93	04:34.45	22.4 S	172.7 E	33	5.1			LOYALTY ISL
30NOV93	04:59.26	59.1 S	18.1 W	33	5.2			S. W. ATLANTIC
30NOV93	20:37.12	39.3 N	75.6 E	19	5.2			XINJIANG
30NOV93	20:44.13	17.0 S	177.1 W	412	5.2			FIJI ISL
01DEC93	00:59.01	57.5 S	25.9 W	33	5.4			SANDWICH ISL
01DEC93	01:51.06	2.5 S	139.8 E	33	5.0			IRIAN JAYA
01DEC93	08:21.54	6.3 S	128.0 E	362	5.1			BANDA SEA
01DEC93	13:23.56	23.2 S	71.1 W	33	5.1			CHILE
01DEC93	13:42.15	17.4 S	168.2 E	80	5.0			VANUATU ISL
01DEC93	15:55.05	10.3 N	126.6 E	33	5.2			PHILIPPINE ISL
01DEC93	17:24.27	12.1 N	86.5 W	126	4.7			NICARAGUA
01DEC93	22:04.22	12.8 S	44.8 E	10	5.1			MADAGASCAR
01DEC93	22:18.27	1.4 N	66.5 E	10	5.0			CARLSBERG RIDGE
02DEC93	14:39.17	36.5 N	70.5 E	216	4.8			HINDU KUSH
03DEC93	10:16.19	49.9 S	114.2 E	10	5.1			AUSTRALIA
03DEC93	12:22.17	15.8 S	171.7 W	10	5.0			SAMOA ISL
03DEC93	12:36.28	60.3 S	20.4 W	33	5.4			S. W. ATLANTIC
03DEC93	13:16.15	4.9 N	75.6 W	145	4.6			COLOMBIA
04DEC93	09:30.14	41.7 N	142.0 E	84	5.2			HOKKAIDO
04DEC93	14:11.28	69.7 N	146.8 W	10	4.8			ALASKA
04DEC93	17:21.23	3.6 S	131.2 E	33	5.2			IRIAN JAYA
04DEC93	18:12.56	11.2 N	86.2 W	33	4.7			NICARAGUA
05DEC93	06:36.24	19.8 N	121.2 E	33	5.0			PHILIPPINE ISL
05DEC93	19:37.02	6.5 S	130.3 E	143	5.7			BANDA SEA
05DEC93	20:33.31	11.8 N	86.8 W	66	5.1			NICARAGUA
06DEC93	02:25.03	28.5 S	176.9 W	79	5.1			KERMADEC ISL
06DEC93	04:59.13	4.7 S	138.3 E	33	5.3			IRIAN JAYA
06DEC93	10:42.03	6.4 S	154.9 E	48	5.6			SOLOMON ISL
06DEC93	15:37.54	41.5 N	142.0 E	69	5.2			ARGENTINA
06DEC93	20:54.45	6.9 N	78.3 E	10	5.4			LACCADIVE SEA
06DEC93	23:00.17	21.8 N	121.0 E	33	5.2			TAIWAN
07DEC93	11:50.14	2.4 S	139.9 E	10	5.0			IRIAN JAYA
07DEC93	14:39.28	5.2 N	82.5 W	10	4.5			PANAMA
07DEC93	16:27.25	0.7 N	122.7 E	79	5.5			MINAHASSA PENIN
08DEC93	00:22.11	20.9 S	175.0 W	45	5.1			TONGA ISL
08DEC93	02:21.02	12.5 S	166.5 E	33	5.2			SANTA CRUZ ISL
08DEC93	23:37.13	6.5 S	129.9 E	106	5.1			BANDA SEA
09DEC93	04:32.22	0.5 N	126.0 E	33	6.3			MOLUCCA SEA
09DEC93	08:27.16	0.5 N	125.9 E	33	5.2			MOLUCCA SEA
09DEC93	11:38.30	0.4 N	125.9 E	33	6.1			MOLUCCA SEA
09DEC93	11:44.00	0.1 N	125.6 E	33	5.2			MOLUCCA SEA
09DEC93	11:50.52	0.3 N	125.8 E	33	5.1			MOLUCCA SEA
09DEC93	12:05.25	0.2 N	125.8 E	33	5.0			MOLUCCA SEA
09DEC93	12:07.36	0.4 N	125.8 E	33	5.1			MOLUCCA SEA
09DEC93	12:40.30	0.3 N	125.8 E	33	5.0			MOLUCCA SEA
09DEC93	14:11.53	0.2 N	125.7 E	33	5.1			MOLUCCA SEA
09DEC93	14:46.58	28.2 S	70.5 W	60	5.1			CHILE
09DEC93	19:14.22	26.1 S	178.4 E	600	5.1			FIJI ISL
10DEC93	01:52.54	10.2 S	161.9 E	33	5.2			SOLOMON ISL
10DEC93	06:31.54	22.1 S	179.7 W	606	5.6			FIJI ISL
10DEC93	08:59.36	20.8 N	121.3 E	19	5.8			PHILIPPINE ISL
10DEC93	11:52.15	19.7 S	178.2 W	613	5.0			FIJI ISL
10DEC93	22:21.17	0.5 N	125.9 E	33	5.2			MOLUCCA SEA
11DEC93	00:01.30	41.9 N	142.5 E	72	5.0			HOKKAIDO
11DEC93	00:07.20	59.5 N	152.4 W	90	4.8			ALASKA
11DEC93	13:04.52	49.7 N	157.2 E	33	5.1			KURIL ISL
11DEC93	14:45.38	0.6 N	126.3 E	33	5.1			MOLUCCA SEA
11DEC93	16:00.44	19.9 S	178.1 W	583	5.1			FIJI ISL
11DEC93	23:47.30	22.0 S	176.5 W	164	5.3			FIJI ISL
11DEC93	23:57.56	19.2 N	64.8 W	33	4.6			VIRGIN ISL
12DEC93	04:28.03	19.7 S	174.4 W	33	5.3			TONGA ISL
12DEC93	05:12.23	51.0 N	160.9 E	33	5.0			KURIL ISL
12DEC93	05:55.13	53.2 N	162.9 W	33	4.6			ALASKA
12DEC93	17:03.20	0.3 N	126.0 E	33	5.8			MOLUCCA SEA
12DEC93	18:26.28	0.3 N	126.0 E	33	5.7			MOLUCCA SEA
12DEC93	20:41.30	36.4 N	141.1 E	43	5.3			HONSHU
12DEC93	23:34.18	27.3 N	92.0 E	33	5.1			XIZANG-INDIA
13DEC93	11:43.43	20.3 S	173.9 W	33	5.6	6.0		TONGA ISL
16DEC93	20:11.25	53.8 N	171.4 E	33	5.9			NEAR ISL

DATE	TIME	LATITUDE	LONGITUDE	DEPTH	M_b	M_s	M_L	LOCATION
20DEC93	13:56.19	6.3 S	130.9 E	33	6.1			BANDA SEA
22DEC93	17:01.16	48.5 N	128.9 W	10	4.3			VANCOUVER ISL
24DEC93	05:18.35	21.7 S	178.8 W	445	5.4			FIJI ISL
28DEC93	21:02.28	43.5 N	110.1 W	8			4.7	WYOMING
29DEC93	07:48.14	20.0 S	169.7 E	33	6.1	6.8		VANUATU ISL
29DEC93	08:00.55	20.0 S	169.7 E	33	5.8			VANUATU ISL
29DEC93	08:39.45	19.7 S	169.7 E	33	6.1	6.6		VANUATU ISL
30DEC93	14:24.07	44.8 N	78.8 E	33	5.9			KAZAKHSTAN
31DEC93	12:16.48	6.9 S	129.6 E	133	5.5			BANDA SEA
31DEC93	18:08.45	42.3 N	122.0 W	5			4.2	OREGON

Saved Time Periods of Local Sequences

DATE	TIME SPAN	DESCRIPTION
12OCT91	06:48-22:29	INDIO SWARM
19FEB92	06:22-17:36	COSO SWARM
19FEB92	19:27-11:31 20FEB92	COSO SWARM
21FEB92	07:09-21:22	COSO SWARM
22FEB92	00:52-17:59	COSO SWARM
23FEB92	10:25-02:12 24FEB92	COSO SWARM
22APR92	19:46-08:34 24APR92	JOSHUA TREE
24APR92	12:56-09:05 30APR92	JOSHUA TREE
30APR92	21:45-22:13 05MAY92	JOSHUA TREE
05MAY92	00:00-23:49 14MAY92	JOSHUA TREE
14MAY92	23:54-23:11 15MAY92	JOSHUA TREE
15MAY92	23:24-02:18 01JUN92	JOSHUA TREE
01JUN92	11:06-04:27 02JUN92	JOSHUA TREE
28JUN92	03:59-13:43 29JUN92	LANDERS
30JUN92	01:38-01:03 01JUL92	LANDERS
01JUL92	01:14-18:10	LANDERS
01JUL92	18:16-02:52 02JUL92	LANDERS (possible gaps)
02JUL92	02:52-00:39 04JUL92	LANDERS (possible gaps)
04JUL92	00:39-04:44 06JUL92	LANDERS
06JUL92	04:44-15:39 06JUL92	LANDERS (some gaps)
06JUL92	16:07-11:18 15JUL92	LANDERS
15JUL92	19:55-08:13 16JUL92	LANDERS
17JUL92	16:51-23:23 20JUL92	LANDERS
21JUL92	01:40-18:44	LANDERS
21JUL92	18:52-23:??	LANDERS
22JUL92	00:03-01:56 23JUL92	LANDERS
23JUL92	16:10-13:40 30JUL92	LANDERS
30JUL92	13:40-22:00	LANDERS (some gaps)
30JUL92	22:00-21:39 03AUG92	LANDERS
03AUG92	22:10-16:37 06AUG92	LANDERS
06AUG92	19:43-15:03 12AUG92	LANDERS
12AUG92	23:51-13:06 19AUG92	LANDERS
19AUG92	21:54-17:56 20AUG92	LANDERS
21AUG92	23:38-19:59 24AUG92	LANDERS
24AUG92	23:51-16:18 25AUG92	LANDERS
26AUG92	00:12-16:52 26AUG92	LANDERS
27AUG92	00:31-20:53	LANDERS
27AUG92	20:53-06:55 28AUG92	LANDERS (possible gaps)
28AUG92	06:55-23:10	LANDERS
29AUG92	11:18-17:47 31AUG92	LANDERS
31AUG92	18:10-20:24 01SEP92	LANDERS
01SEP92	23:35-18:57 02SEP92	LANDERS
03SEP92	07:31-14:34	LANDERS
05SEP92	01:31-17:03 08SEP92	LANDERS
08SEP92	19:12-21:47 11SEP92	LANDERS
11SEP92	22:44-18:59 15SEP92	LANDERS
15SEP92	20:14-21:05 21SEP92	LANDERS
21SEP92	22:07-17:39 29SEP92	LANDERS
29SEP92	18:13-10:39 30SEP92	LANDERS
30SEP92	10:39-18:07 30SEP92	LANDERS (some gaps)

Miscellaneous

DATE	TIME OF EVENT OR TAPE	DESCRIPTION
16APR91	15:30.OO	NTS BLAST 37.2 N 116.4 W
14SEP91	19:00.00	NTS BLAST 37.2 N 116.4 W
18SEP91	07:31	SPACE SHUTTLE SONIC
18OCT91	19:12.00	NTS BLAST 37.1 N 116.0 W
31OCT91	14:10-18:32	SONIC
21NOV91		SONIC
26NOV91	18:35	NTS BLAST 37.1 N 116.1 W
30JAN92	12:32-16:30	SONIC & SPACE SHUTTLE SONIC
11FEB92	03:03-14:28	PACE BLASTS
13FEB92	03:13-08:47	PACE BLASTS
13FEB92	08:47-14:24	PACE BLASTS
16FEB92	04:51-10:28	PACE BLASTS
26MAR92	16:30.00	NTS BLAST 37.3 N 116.4 W
16MAY92	19:36-04:14	SPACE SHUTTLE SONIC
21MAY92	5:00.00	CHINESE NUKE 41.6 N 88.8 E
16JUL92	21:58-08:13 17JUL92	CALIBRATION SHOTS
10SEP92		EXPLOSION
16SEP92	16:24	SONIC
29SEP92		SONIC
30SEP92	02:10-10:39	MICROSEISM STORM
30SEP92	15:20	SONIC
30SEP92	18:07-02:57 01OCT92	MICROSEISM STORM
02OCT92	04:13-13:01	MICROSEISM STORM
02OCT92	13:01-21:37	MICROSEISM STORM
02OCT92	21:37-06:15 03OCT92	MICROSEISM STORM
15OCT92	13:38	SONIC
29DEC92	18:00	MICROSEISM STORM
06MAY93	14:30	SPACE SHUTTLE SONIC
10JUN93	15:10.00	NEW MEXICO EXPLOSION 33.7 N 106.5 W
18JUN93	01:46	ROCKET TEST
18JUN93	21:08	ROCKET TEST
25JUN93	18:04	ROCKET TEST
01JUL93	02:54	ROCKET TEST
16JUL93	20:05	ROCKET TEST
14SEP93	07:00 07:02 07:04 07:06 07:08 10:00 10:02 10:04 10:06 10:08	SSCD SHOTS (SIERRA BLASTS)
18SEP93	07:00 07:02 07:04 07:06 07:08 07:10 07:12 10:00 10:02 10:04 10:06 10:08 10:10 10:12	SSCD SHOTS (SIERRA BLASTS)
01NOV93	15:00.00	SPACE SHUTTLE SONIC
17NOV93	22:00.00	SONIC
08DEC93	18:28-19:10	BOOMS AT STAT. SBK (SR-71?)
	18:29.16	
	18:50.33	three main booms
	19:02.33	
	19:04.10	weak boom-src unknown

Index