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U.S. Geological Survey

**MULTICHANNEL SEISMIC-REFLECTION DATA COLLECTED  
IN 1983 OFF OF CENTRAL CALIFORNIA, MONTEREY BAY**

by

Dennis M. Mann and Gary H. Greene

Open File Report

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U.S. Geological Survey, Menlo Park, CA 94025

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During July and August of 1983, the U.S. Geological Survey (USGS) conducted two reconnaissance geophysical surveys off of the central coast of California and in Monterey Bay (fig. 1). The primary purpose of the two cruises were to test various parts of the shipboard systems to prepare the ship for a year-long season in the South Pacific Ocean and Antarctica. Due to various technical problems being worked out, several lines of data that were run did not result in any processable data. However, approximately 275 km of multichannel seismic-reflection data were recorded along five tracklines. The profiles were collected on the USGS Research Vessel *Samuel P. Lee*, (USGS survey identifiers L1-83-NC and L2-83-NC).

Seismic energy was provided by a tuned array of five airguns with a total volume of 1212 cubic inches of air at a manifold pressure of approximately 1950 psi. The recording system consisted of a 24-channel, 2400 meter long streamer with a group interval of 100 m, and a GUS (Global Universal Science) model 4200 digital recording instrument. A shooting geometry of 50-m shotpoint intervals with 100-m group intervals resulted in 24-fold data collection. Navigational control for the survey was provided by a Magnavox integrated navigation system using transit satellites fixes, and doppler-sonar speed log augmented by Loran-C (Rho-Rho). A 2-millisecond sampling rate was used in the field; the data were later desampled to 4-milliseconds during the demultiplexing process. Record length of 5 or 6 seconds were recorded which combined with deep water delay yielded up to 10 seconds of two-way travel time. Processing was done at the USGS processing center in Menlo Park, California, in the sequence editing-demultiplexing, velocity analysis, CDP stacking, deconvolution-filtering, and plotting on an electrostatic plotter (Table 1). Plate 1 is a trackline chart showing detailed shotpoint navigation.

The data are available in the following formats:

1) Electrostatically plotted profiles which have been deconvolved and filtered after stacking. Copies of the profiles may be purchased through:

National Geophysical Data Center  
NOAA/EDIS/Code D64  
325 Broadway  
Boulder, Colorado 80303

2) Digital magnetic stack tapes which have been processed using velocities derived from velocity analysis. These tapes are not deconvolved or band-pass filtered. Stack tapes are in SEG-Y format. Copies of the stack tapes and a description of the tape format can be obtained at the requesters expense by contacting:

Dennis M. Mann  
U.S. Geological Survey  
345 Middlefield Rd. MS 999  
Menlo Park, California 94025  
Tel. (415) 354-3174

3) Digital magnetic demultiplexed tapes. These tapes have been edited for missed shots and muting times. Demultiplexed tapes are in Phoenix I format- a Seismograph Service Corp. modified SEG-X 32-bit floating point format. Copies of the demultiplexed tapes and a description of the tape formats can be obtained at the requesters expense by contacting Dennis Mann at the above address.

4) A presentation of the geologic and geophysical framework of offshore Central California is available in:

McCulloch, David S., Regional Geology and Hydrocarbon Potential of Offshore Central California, *in* Scholl, D.W., Grantz, A., and Vedder, J.G., 1988, Geology and Resource Potential of the Continental Margin of Western North America and Adjacent Ocean Basins - Beaufort Sea to Baja California Region, Circum-Pacific Council for Energy and Mineral Resources Earth Science Series, Vol. 6: Circum-Pacific Council for Energy and Mineral Resources, Houston, Texas. p. 353-402

5) Additional copies of this report may be obtained by contacting:

Books and Open-File Reports Section  
U.S. Geological Survey  
P.O. Box 25425  
Federal Center, Bldg 810  
Denver, Colorado 80225  
Tel. (303) 236-7476

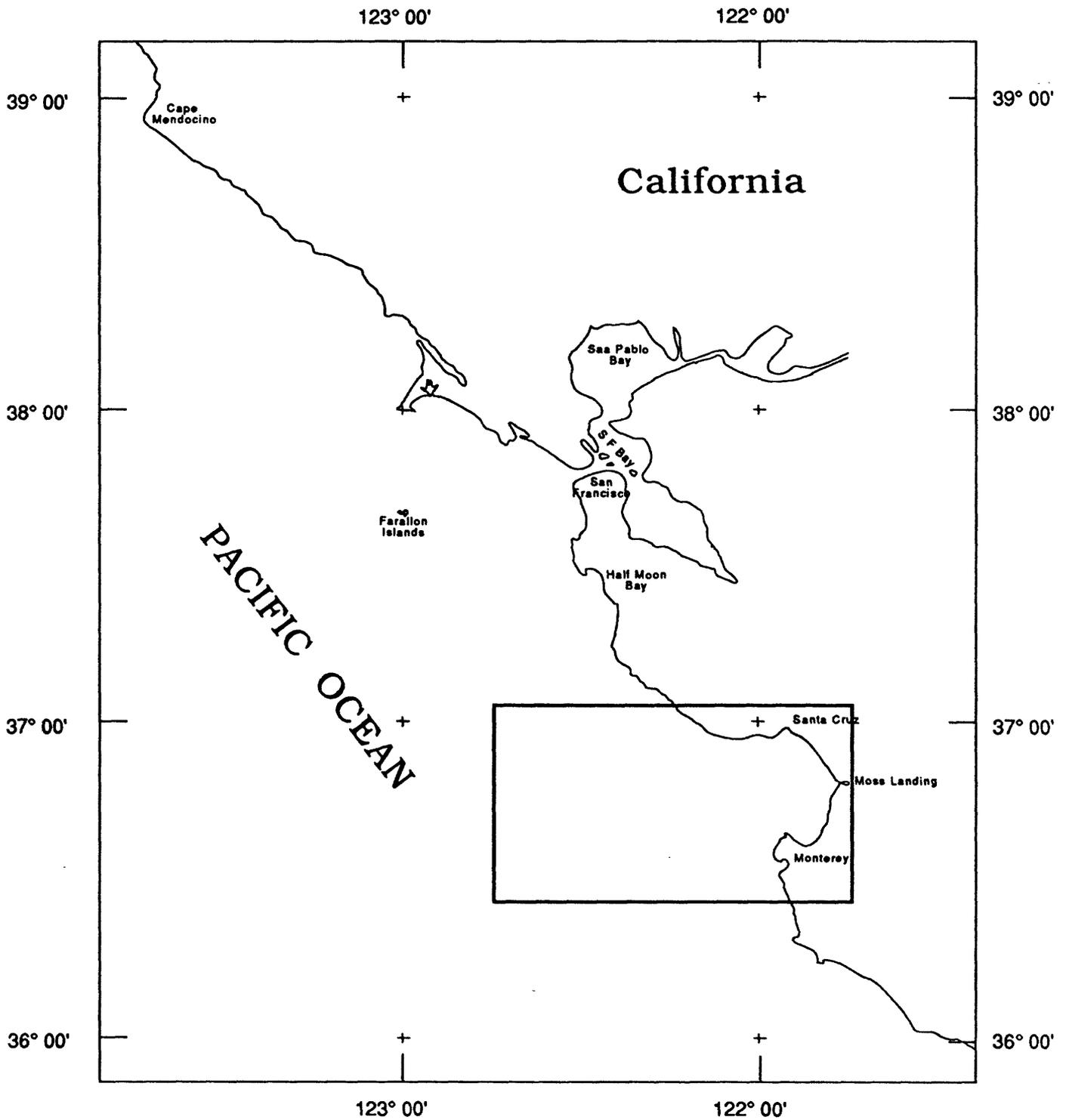


Figure 1. Area of study. Plate 1 shows detailed location of tracklines and shotpoints.

RECORDING PARAMETERS	
<b>DATE RECORDED:</b>	7/83-8/83
<b>SOURCE:</b>	BOLT AIR GUNS
Airguns in Array:	5
Net Volume:	1212 cu. in.
Manifold Pressure:	2000 psi
Gun Depth:	8.5 m
Shot Spacing:	50 m
<b>STREAMER:</b>	SEI MULTIDYNE, CHARGE COUPLED
<b>GEOMETRY:</b>	
<p>The diagram illustrates the streamer geometry. A horizontal line represents the streamer, with a total length of 2611 m indicated by a double-headed arrow below it. The streamer is divided into two main sections: a 'SOURCE' section of 297 m and a 'SHIP' section of 38 m. The 'SOURCE' section is further divided into 'CENTER FAR TRACE' and 'CENTER NEAR TRACE'.</p>	
Group Interval:	100 m
Average Depth:	12 m
Group Length:	100 m
Phones/Group:	60
Depth Controllers:	SEI Variable Wing Birds
<b>RECORDING:</b>	GUS HDDR 4200, Binary Gain
Sample Interval:	2 ms
Record Length:	5-6 s
GUS Recording Filter:	5-110 Hz
Number of Channels:	24
<b>NAVIGATION:</b>	Magnavox Integrated System
Shot On:	Distance
Primary Navigation:	Satellite Doppler Sonar
Direction Recorded:	NW
PROCESSING SEQUENCE	
<b>DATE PROCESSED:</b>	7/90
<b>1. DEMULTIPLEX:</b>	
Desample:	4 ms
Gain Recovery:	
Reformat:	Phoenix 1
<b>2. TRACE SHOT EDIT:</b>	
<b>3. STATIC CORRECTIONS:</b>	
Recording Statics:	156 ms
Datum:	Sea Level
<b>4. CDP SORT:</b>	
<b>5. VELOCITY ANALYSIS:</b>	
Window Length:	100 ms
Window Interval:	4 ms
Band Pass Filter:	3-6-40-50 Hz
Velocity Range:	1400-4000 ms
<b>6. NMO CORRECTION:</b>	
<b>7. 24-FOLD TAPER STACK:</b>	Weighted
<b>8. BANDPASS FILTER:</b>	Cosine
Filter Points:	101
Time Window:	0.0 - 8.0 s
Frequency:	4-8-35-45 Hz
<b>9. PREDICTIVE DECONVOLUTION:</b>	
Design Window:	2000 ms
Operator:	200 ms
Gap:	32 ms
<b>10 AGC WINDOW:</b>	500 ms
PLOT PARAMETERS	
<b>MODE:</b>	Variable Area/Wiggle Trace
<b>HORIZONTAL SCALE:</b>	20 Traces/in.
<b>VERTICAL SCALE:</b>	1.75 in/s
<b>CLIP:</b>	1.75 Trace Widths
<b>GAIN:</b>	1.0 (Scalar)

Table 1. Recording parameters, processing sequence and plot parameters for stacked multichannel seismic-reflection data collected on USGS cruises L1-83-NC and L2-83-NC.