

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

OFFSHORE SEISMIC REFLECTION PROFILES
IN THE VICINITY OF THE CRISTIANITOS
FAULT, SAN ONOFRE, CALIFORNIA

by

H. G. Greene, S. H. Clarke, and B. A. Seekins
Menlo Park, California 94025

OPEN FILE REPORT 80-945

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards (and stratigraphic nomenclature). (Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS).

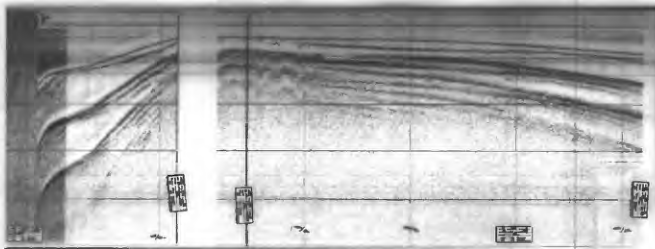
The U.S. Geological Survey collected continuous seismic reflection profiling data in the vicinity of the Cristianitos fault, San Onofre, California (approximately between latitudes $33^{\circ}07'30''\text{N}$ and $33^{\circ}22'30''\text{N}$, and longitudes $117^{\circ}25'00''\text{W}$ and $117^{\circ}40'00''\text{W}$; see map) during two recent cruises aboard the R/V SEA SOUNDER (Figs. 1-5). These cruises, which covered several other widely separated areas of the southern California borderland, were conducted in 1978 (S2-78-SC) in cooperation with the Bureau of Land Management (USGS/BLM MOU AA551-MU8-15), and in 1979 (S2-79-SC) in cooperation with the Office of Earthquake Studies, U.S. Geological Survey.

Single-channel high-resolution continuous seismic reflection profiles were collected using a Uniboom system in 1978 and Uniboom and minisparker systems in 1979. The Uniboom system employed 4 hull-mounted transducers and a hydrophone streamer towed 3 m off either beam approximately 0.3 m below the sea surface. Power output ranged from 800 to 1200 J. and the incoming signal was filtered between 400 - 500 Hz (low cut) and 1,000 - 1,500 (high cut). A fire and sweep rate of 0.5 second was used. The minisparker system employed a multipoint-source sparker electrode. Power output was 1 kJ. The position of the towed hydrophone streamer and the filter settings were as described above for the Uniboom system. In addition, a very high resolution, 3.5 kHz profiling system employing a hull mounted transducer was used to collect shallow subbottom records. All high resolution seismic reflection data were recorded on EPC 4100 recorders.

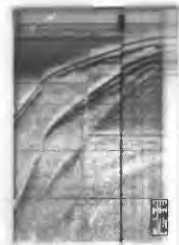
A sparker system operated at 80 - 140 kJ was used to obtain low-resolution intermediate- to deep-penetration records. This system has a fundamental frequency of approximately 80 Hz and was filtered between 50 Hz and 98-125 Hz; fire and sweep rates were 4 seconds. Four sparker ladders were towed astern at a depth of 3 m; two ladders were located approximately 3 m outboard from the ship and 45 m astern, and two were towed approximately 6 m outboard from the ship and 60 m astern. The hydrophone streamer consisted of a 45 m-long active section containing 100 elements; the streamer was towed at a depth of 3 m directly astern, with the lead hydrophone approximately 600 m aft of the ship. Data were recorded on Raytheon recorders.

Navigation during these surveys was done by the scientific staff using a Magnavox integrated satellite/doppler navigation system, Loran C system, and a shipborne electronic ranging system (Motorola Miniranger) employing shore-based transponders. Estimated average position accuracy is ± 50 m.

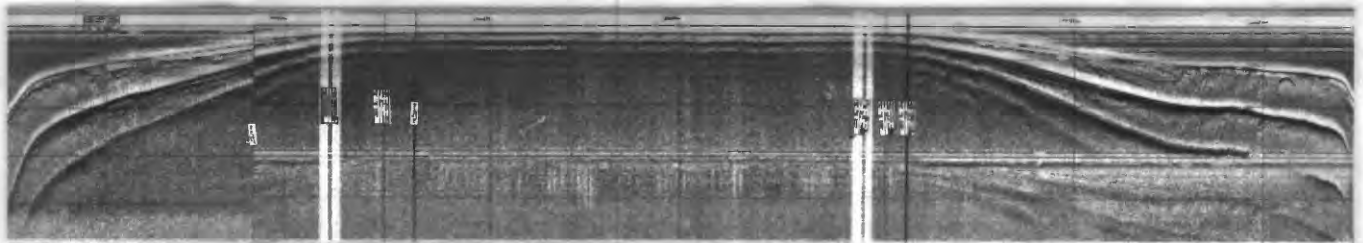
SEISMIC REFLECTION PROFILES



Lines 20 and 21
1200-1318



Line 52
0250-0301



Lines 56, 57 and 58
0550-0737

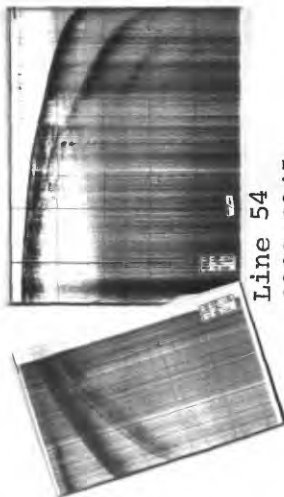


Line 63
1854-0737

Figure 1. Very high resolution, 3.5 kHz records from S2-79-SC.
Time in Greenwich mean time.



Line 21
1311-1323

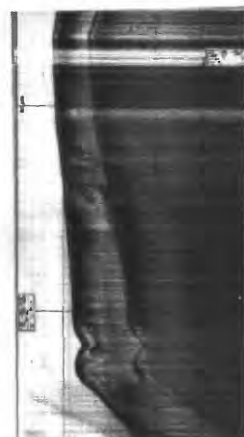


Line 54
0323-0345

Line 52
0301-0250

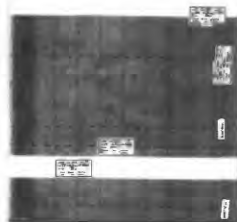


Lines 56, 57 and 58
0552-0737

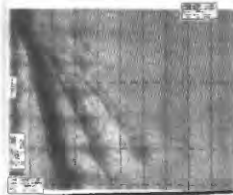


Line 63
1850-1900

Figure 2. High resolution, Uniboom^{1/} and minisparker records from S2-79-SC. Time in Greenwich mean time.



Lines 20 and 21
1200-1318



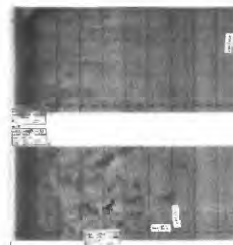
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0145-0301



Line 54
0326-0435



Line 56
0513-0618



Lines 57 and 58
0621-0745



Line 63
1401-1900

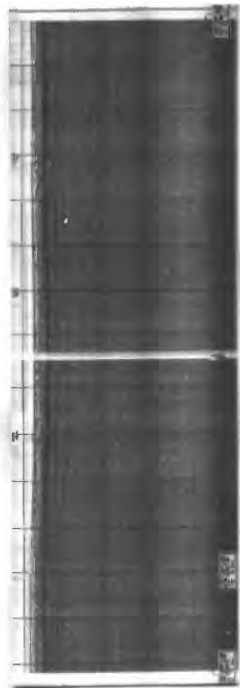
Figure 3. Deep-penetration sparker records from S2-79-SC.
Time in Greenwich mean time.



Line 21
0804-0825



Line 23
1531-1546



Line 24
1548-1700



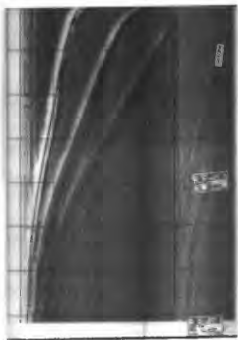
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1703-1740



Line 27
0043-0122



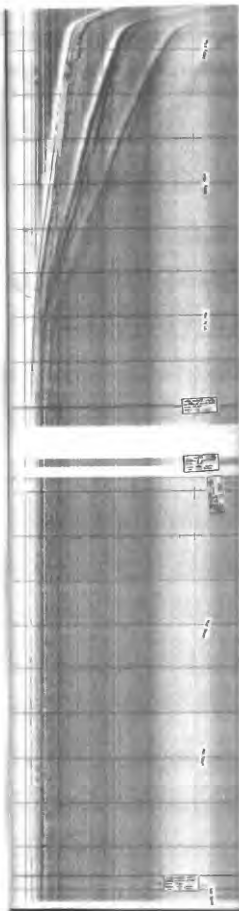
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0144-0220



Line 29
0144-0220



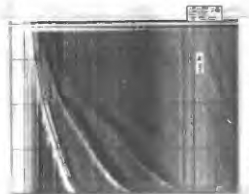
Line 31
1945-2013



Lines 32 and 33
2010-2150



Line 19
750-802

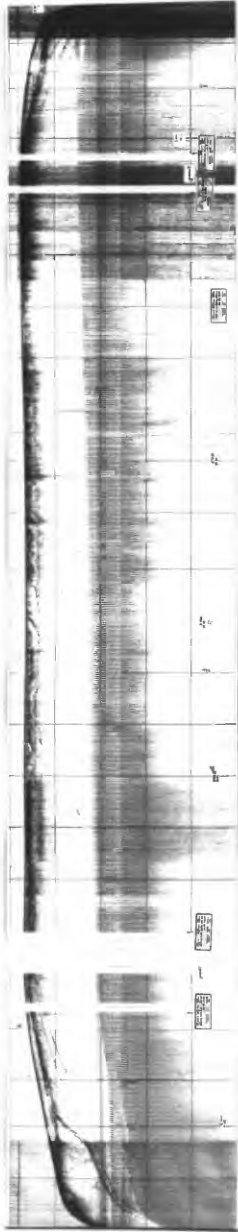


Line 35
0915-0933

Figure 4. Very high resolution, 3.5 kHz records from S2-78-SC.
Time in Greenwich mean time.



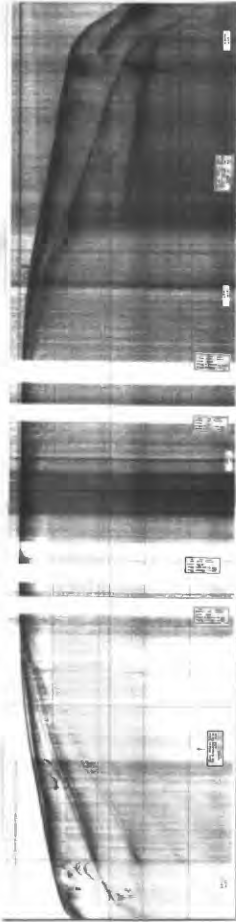
Line 21
0805-0823



Lines 23, 24 and 25
1530-1725



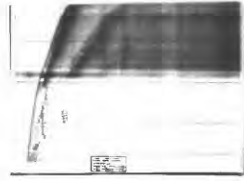
Line 19
750-802



Lines 27, 28 and 29
0040-0220



Lines 31, 32 and 33
1945-2150



Line 35
0750-0930

Figure 5. High resolution, Uniboom^{1/}, records from S2-78-SC.
Time in Greenwich mean time.