

BRUCE P. LUYENDYK

REPRODUCING COPY  
SEA Grant Depository

UNIVERSITY OF CALIFORNIA  
Santa Barbara

The Southern Termination of the Hosgri Fault Zone,  
Offshore South-Central California

A Thesis submitted in partial satisfaction  
of the requirements for the degree of

Master of Science

in

Geophysics

by

John William Steritz

LOAN COPY ONLY

NATIONAL SEA GRANT DEPOSITORY  
PELL LIBRARY BUILDING  
URI, NARRAGANSETT BAY CAMPUS  
NARRAGANSETT, RI 02882

Committee in charge:

Professor Bruce P. Luyendyk, Chairman

Professor Michael Fuller

Professor Ralph J. Archuleta

Research sponsored by California Sea  
Grant College Program; Project  
Number R/OT-10 (Luyendyk); Grant  
Number NA80AA-D-00120

August 1986

## ACKNOWLEDGMENTS

Three dimensional computer graphics used to illustrate segments of the seismic interpretation are made possible by the work of Peter Slaughter. Debbie Burdick of the Minerals Management Service conceived this study of the Hosgri fault zone and was a constant help in providing seismic data. Bob Gaal of the California State Lands Commission helped in furnishing additional data. This work was supervised by Bruce Luyendyk and funded by the California Sea Grant, Project USDC R/OT-10/Luyendyk.

## ABSTRACT

### The Southern Termination of the Hosgri Fault Zone, Offshore South-Central California

by

John William Steritz

The San Gregorio-Hosgri fault is the major coastal fault in central California. The Hosgri splays from the San Andreas fault just north of San Francisco, slices onshore in places over its northern segment, and continues in the offshore towards its southern termination at the latitude of the Transverse Ranges. Previous public offshore mapping has failed to determine whether the Hosgri terminates abruptly at the latitude of the Transverse Ranges, whether it swings east to join Transverse Range faults, or whether it continues south past Point Conception. Using 1.0 to 2.5 second seismic reflection data, a detailed map has been produced of upper Miocene-Pliocene structure in the offshore from Purisima Point to Point Conception. The Hosgri fault zone is seen as a definite structural boundary separating mostly NW-SE trending structure to the west from Transverse Range structure to the east. The Hosgri is mapped in the offshore to the latitude of Point Conception where it apparently ends by abutting E-W structures in the westernmost Santa Barbara Channel. The style of faulting on the Hosgri varies according to changes in

its trend. Sections of the Hosgri west of Purisima Point and south of Point Arguello that trend close to NW-SE show a greater component of reverse separation compared to a section of the Hosgri just north of Point Arguello which trends nearly N-S. Structural and plate tectonic evidence suggests an ideal orientation of right-slip close to N5W at the southern termination of the Hosgri; thus more reverse separation is expected on NW-SE trending Hosgri sections. East-side-up vertical offsets on the Hosgri in the vicinity of Purisima Point and about Point Arguello, increase to more than 300 m. Structural mapping about the southernmost Hosgri is consistent with a model of western Transverse Range rotation involving approximately 100 km of right-slip in the offshore fault system of central California. On the basis of structural evidence, movement on the Hosgri fault zone began before upper Miocene time and continues at the present. The amount of lateral displacement on the southernmost Hosgri is undetermined due to the lack of piercing points evident in seismic reflection data.