

ABSTRACT

HIGHLIGHTS OF GEOPHYSICAL AND GEOLOGIC STUDIES IN THE GULF OF MEXICO DURING 1969 FROM THE USNS KANE

During 1969, the U. S. Geological Survey and the U. S. Naval Oceanographic Office completed a joint effort a basinwide survey of the Gulf of Mexico. The survey was carried out in two phases of investigations: Geophysics along 15,000 miles of track that included magnetics, gravity, and acoustical profiling using a 160 KJ sparker seismic system; and sampling of bottom sediments by piston corer. For the sediments studies scientists of the two Federal Agencies were joined by scientists from Rice University, Texas A&M University, The Marine Institute of the University of Texas, Louisiana State University, and Florida State University.

The basinwide acoustical profiles dramatically demonstrated the role salt has played in the tectonics of the northern and western Gulf of Mexico. The records reveal that growth of most of the diapirs has occurred in stages and that the several physiographic provinces of the western Gulf of Mexico are expressive of both the geometry of the diapirs and of the magnitude of deformation to which the strata have been subjected. Across the abyssal plain several prominent reflecting horizons were recorded to a depth of 4.7 seconds. The sequences of strata across the abyssal plain indicate changes in directions of sediment transport through time. Profiles in the southern and eastern Gulf of Mexico across scarps of the Campeche and Florida carbonate platforms show prominent rimming reef-like structures that seem to have persisted throughout much of the Cretaceous period. The presence and thickness of these reef-like masses suggests large scale subsidence of the eastern Gulf of Mexico floor since Cretaceous time.

Maps of trace element distribution in bottom sediments suggest that both bottom transport processes and emissions from salt masses have played a part in patterns of concentration. Core samples from the continental slope in the northern and eastern Gulf of Mexico indicate a high content of sulphide minerals