

AAPG Annual Convention  
Salt Lake City, Utah  
May 11-14, 2003

Andrew C. Weinzapfel<sup>1</sup>, Richard A. Mountfield<sup>2</sup>, Yves M. Chevalier<sup>2</sup>, Lung-Chuan Kuo<sup>2</sup>, Khalid A. Soofi<sup>2</sup>,  
Geoffrey A. Haddad<sup>2</sup>, Matthew O. Strickland<sup>2</sup> (1) ConocoPhillips, Houston, TX (2) ConocoPhillips,

### **New Insights into the Hydrocarbon Prospectivity of an Undrilled Mud Diapir Province, West Alboran Basin, Morocco-Spain**

A systematic global study of the distribution, hydrocarbon potential, and genesis of mud diapir belts has targeted the offshore Western Alboran Basin as a potential frontier hydrocarbon province. Recently acquired data strongly support the presence of a working petroleum system.

New seismic records illuminate a coherent stratigraphic section exceeding 12 km thickness. This section is significantly thicker than estimates of previous workers. The basin center contains discrete, approximately circular mud diapirs, as well as elongate diapiric walls, originating from a basal rift sequence. Diapirs rise along preferred structural weaknesses, mostly aligned with Early to Middle Miocene half graben faults. A few mud volcanoes up to 125 meters high and 1000 meters diameter generate anomalous sea floor topography.

Seabed coring, targeting mud volcanoes and other features apparent on a multibeam-swath bathymetry survey, has found evidence of thermogenic hydrocarbons. It is believed that the diapiric mother bed in the early rift sequence is the primary source rock. Middle Miocene clastic reservoirs and Middle to Upper Miocene top seals are inferred. Oil and gas expulsion is estimated to have begun in Late Miocene, coincident with a major phase of structural deformation.