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Noel Holguin<sup>1</sup>, Joel Lara<sup>2</sup>, Luis Medrano<sup>3</sup>, Bernie Bernard<sup>4</sup>, James M. Brooks<sup>5</sup>, John Zumberge<sup>6</sup> (1) PEMEX, Mexico City, Mexico (2) PEMEX Exploration and Production, Mexico City, Mexico (3) PEMEX Exploration and Production, Mexico City, Mexico (4) TDI-Brooks International Inc, College Station, TX (5) TDI-Brooks, College Station, TX (6) GeoMark Research, Houston, TX

## **PEMEX's Surface Geochemical Exploration Studies in the Southern Gulf of Mexico**

PEMEX Exploration & Production has acquired nearly 900 piston cores in the southern Gulf as part of surface geochemical exploration (SGE) evaluations of the shelf and deep water regions. These cores were targeted based on 2-D and 3-D seismic data over faults to evaluate potential petroleum systems present. Macroseepage of oil and gas was commonly observed from the Gulf of Campeche to near the US/Mexican border at both continental shelf and slope water depths. Numerous cores showed visible oil staining and/or gas charge. About one hundred (100) macroseep samples have been analyzed for aliphatic and aromatic biological markers and correlated using multivariate statistical techniques with Mexican and greater Gulf of Mexico oils. Most of the seep samples classify as Family SE2 which implies a Jurassic (probably Tithonian) carbonate-rich source or combination of closely related sources. Oils in this family also occur in the deep offshore US Gulf where they contribute to important oil accumulations. The SGE piston coring data has been supplemented with SAR remote sensing images for most of the southern Gulf region. The remote sensing data correlate with the SGE piston coring data and shows active seepage to the sea surface regionally throughout the Mexican offshore. The SGE and remote sensing studies confirm the presence of active petroleum systems throughout much of the Mexican continental shelf and slope that is primarily a Jurassic carbonate-rich source, although with other oil families present in specific localities. Oil seepage is as common on the Mexican slope as on the prolific northern Gulf slope.