Neogene Sandstone Provenance and Petrographic Families, Southern Gulf of Mexico

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ABSTRACT

Conventional cores from the main Neogene sandstone units of the southern Gulf of Mexico basin were sampled by Pemex for petrographic analysis. Description of 2564 thin sections, including 1928 point count analyses, allowed us to identify six compositional families. Two types of volcanic litharenites are present on the offshore sector, in front of the Veracruz State. From those: (1) one family of sandstones of intermediate and acid composition, located to the west of the study area, has a Transmexican Volcanic Belt (TMVB) compositional affinity. (2) the second family of basic composition is mainly related to the Tuxtlas Volcanic Complex. (3) The Salina Basin, which extends into the deep Gulf of Mexico, contains lithic arkoses with a provenance related to the Chiapas Plutonic Complex. (4) Arkosic litharenites are the main composition observed at the Macuspana and Comalcalco basins including their marine counterparts; the Chiapas Fold and Thrust Belt is the main source for these sandstones. (5) Bioclastic grainstones (calcarenites) are present in the proximities of the Yucatan Platform. Finally, (6) a Neogene calclithitic family with local variations to volcanic and metamorphic sandstones is present along the Veracruz Basin, and is derived mainly from the Sierra Madre Oriental. The local petrographic variations include volcanic components deposited at the north and northwest sectors, low grade metamorphic fragments at the west, and high grade metamorphics and quartz grains deposited at the south and east sectors. These petrographic variations illustrate local influence of different sources of sediment, such as the TMVB, the Cuicatlan Metamorphic Complex, and the Mixtequita Plutonic and Metamorphic Complex within the Veracruz Basin.

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