

# **Sandstone Petrography and U–Pb Zircon Provenance of Onshore Eocene-Miocene Strata Flanking the Sureste Basin, Southern Mexico: Implications for Sediment Routing to the Deep Gulf of Mexico**

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## **Abstract**

Cenozoic strata in the states of Chiapas, Tabasco, and Veracruz in southern Mexico contain a relatively complete record of a dynamic, rapidly-evolving active tectonic setting at the southernmost promontory of North America. Improved geochronologic age control and provenance from U–Pb detrital zircon geochronology combined with sandstone composition in Oligocene and Miocene strata reveal a link between onshore rocks in the strike-slip orogen of Chiapas and Veracruz and Middle to Upper Miocene deep-sea fan deposits of the central Gulf of Mexico. Studied strata range in age from early Eocene to Pliocene and consist of sandy and conglomeratic turbidites deposited in channels and levee complexes interbedded with thick mudstone successions. At least five different conglomeratic successions, one as much as 800 m thick, are present in the Eocene to Miocene section and likely represent the fill of submarine canyons near the edge of the ancestral Sureste Basin. Uncertainty regarding the ages of these conglomerates has led to confusing stratigraphic nomenclature and difficulty in correlating onshore and offshore strata. Petrographic data from Upper Cretaceous-Eocene sandstone suggests a collisional orogen provenance, whereas volcanic-lithic sandstones dominate the younger section, indicating emergence of arc sources by Oligocene time. Middle to upper Miocene sandstone is compositionally similar to coarse-grained turbidites of the “Veracruz fan” recovered from DSDP wells of the Sigsbee Plain (Hessler et al., 2018, *Geology*). Onshore Eocene strata lack syndepositional zircon grains, whereas Oligocene to Upper Miocene strata contain young zircon grains that yield maximum depositional ages inferred to represent nearly true depositional ages, permitting correlation with Veracruz fan strata. Detrital zircon age distributions from conglomeratic strata in the strike-slip onshore province and sandy channels of the Macuspana Basin most resemble those of the Veracruz fan and suggest the possibility of multiple source contributions to the deepwater Gulf of Mexico.