Today's Pertinent Research Questions, Mexico to Trinidad

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ABSTRACT

Since the early 1980s, Tectonic Analysis Ltd. has conducted industry-sponsored exploration research programs across the Gulf of Mexico, Mexico, Central America, the Caribbean, northern South America, the Equatorial Atlantic, and the Andes, all set within the plate kinematic framework of its model for Atlantic opening. Data for many of these inter-regionally dovetailing programs have been supplied by national oil companies and ministries of energy, complemented by field work, lab analyses, and synthesis of the literature. The geological syntheses stemming from these programs largely provide our accepted models for tectonic and basin evolution in the countries addressed. It follows, then, that Tectonic Analysis Ltd. has also identified most of the more significant problematic issues needing further research today. This talk will briefly show the model, highlight a number of the remaining issues (listed below), and outline favored resolutions for several of them. Acceptance or rejection of these resolutions will depend upon future research and data acquisition efforts, some of which will be expensive.

(1) Positions and tectonic styles of Early and Middle Jurassic mega-shears across Mexico, which allowed Mexican crust to migrate into the area occupied by Colombia in the Triassic.

(2) Mechanism for creating the array of syn-rift basement highs and lows from the Mississippi Salt Basin to the South Florida Basin/western Bahamas.

(3) Determining if, and why, there appears to be an 8 m.y. gap between Louann/Campeche Salt and Smackover deposition in the northern and southern Gulf of Mexico, and assessing the implications for exploration.

Pindell, J., and D. Villagómez, 2019, Today's pertinent research questions, Mexico to Trinidad: GeoGulf Transactions, v. 69, p. 585–586.

(4) Characterizing the crustal properties beneath the mobilized salt in the northern Gulf of Mexico: hyper-extended continent, exhumed mantle, or igneous?

(5) Determining if the oceanic crust of the Gulf of Mexico continues beneath the eastern Veracruz and northern Salinas basins.

(6) Determining if South America became a Paleogene convergent margin due to North and South American plate convergence, prior to the diachronous Caribbean oblique collision.

(7) Identifying the sequence of tectonic events that produced the regional unconformities in the greater Eastern Venezuelan Basin.

(8) Determining if the accreted oceanic belt along coastal Colombia and Ecuador represents the southward continuation of the Panama Arc, versus random Caribbean plateau complexes from the Caribbean interior.

(9) Balancing the 1100 km of Cayman Trough opening with the apparent 400 km offset between similar rock suites in Cuba and Hispaniola.

(10) Definition and origin of basement beneath Nicaragua Rise, and explaining the occurrence of Smackover-like (Jurassic) oils in Cretaceous-Cenozoic Jamaica.

(11) Constraining the Triassic configuration of northern Andean basement blocks, to improve our views on the rift and break up history between Colombia and Mexico.

(12) Better calibration of the opening history of the Grenada-Tobago intra-arc basin.