Correlation of Active Faults and Ancient Terrane Boundaries within and around the Caribbean Plate

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ABSTRACT

The Caribbean Plate is a small, but seismically active, plate bounded to the north and south by active strike-slip fault systems, and on the east and west by active subduction zones and volcanic arcs. Using GIS, we have digitized the existing fault maps from the USGS and combined these with digitized faults from a variety of sources that included published papers, regional geologic maps, and unpublished thesis studies and company reports. The active fault map also indicates points where geomorphological or fault trenching studies have confirmed the presence of active faults. Offshore active faults were determined mainly by locating seismic lines showing that the fault ruptures the younger layers of seafloor sediment. In addition to active, plate boundary faults, we have also included submarine, intraplate faults—many of which have only been recently documented. The basement geology of the Caribbean Plate of seven amalgamated and dissimilar basement terranes which a study by Romito (this meeting) has catalogued using an integration of seismic reflection, gravity, and magnetic data along with wells and seafloor dredges. We have overlaid the active fault map onto the basement terrane map to show that many active faults closely follow ancient terrane boundaries. Interplate examples of fault reactivation include the suture zone between the Great Arc of the Caribbean and the continental edge of South America in Trinidad and Venezuela by faults of the El Pilar and Romeral fault systems. Intraplate examples of fault reactivation include the suture zone between the Caribbean Large Igneous Province and the continental Chortis Block and the Great Arc in Hispaniola.

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