

Changes in relative motion between western oceanic plates and the NW corner of Southamerica: cases of Middle Jurassic and Middle Eocene

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Plate motion of oceanic and continental plates have been clearly identified using the age control and geometry of the oceanic floor, like the case of the opening of the Atlantic Ocean. However, oceanic plates to the west of the northern Andes are younger than 30 Ma or to the north is the buoyant Caribbean plateau that formed in a relative short period of time. Therefore, evidence of the relative movement between oceanic plates that bounded the northern Andes should be unravel from the rock and deformation record along the continental margin. The following evidences are used to define a change from orthogonal to along-strike convergence movement that occurred in Middle Jurassic and Middle Eocene time in the northern Andes: (1) shutdown of regional arc magmatism; (2) magnitude of deformation decrease eastward, as recorded by angular unconformities to the west passing to disconformities to the east; (3) tectonic-driving mechanisms changes the location, geometries and filling pattern of sedimentary basins; (4) New source areas were formed due to the change in convergence style; and (5) northward migration of tectonic blocks as documented by paleomagnetism. In Jurassic time, the change in convergence style of the Farallon oceanic plate (along-strike or rolling back) was responsible for the shutdown (165-170 Ma) of the regional Early to Middle arc magmatism recorded from northernmost Peru, northwestern margin of Gondwana, Mexico terranes and southwestern Laurentia plate. In Eocene time, if the Caribbean plateau formed in southern latitudes, as supported by paleomagnetic data, it was the northward movement of this plate that caused the shutdown of a short-term magmatic arc that formed at the northern margin of the South American plate. The other autochthons hypothesis of the Caribbean plate leaves the question of how a regional oceanic Pacific plate caused local consequences along the continental margin.