1999 GSA Annual Meeting -- Denver, Colorado

Abs. No. 50562

HOLOCENE, INNER FOREARC DEFORMATION IN RESPONSE TO SEAMOUNT SUBDUCTION, PENINSULA DE NICOYA, PACIFIC COAST, COSTA RICA

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Keywords: Costa Rica, tectonics, marine terraces

Along the Pacific coast of Costa Rica, nearly orthogonal convergence occurs at the rapid rate of ~10cm/yr as the Cocos Plate subducts beneath the Caribbean plate at the Middle America Trench. The rough/smooth boundary on the Cocos plate separates a region of pronounced roughness with seamounts that rise up to several thousand meters above the seafloor from a region of relatively smooth crust. The southern tip of the Peninsula de Nicoya lies immediately inboard of this rough/smooth boundary and along the convergence vector for the Christmas, Fisher and related seamounts. With nearly orthogonal coastlines and well preserved Holocene marine terraces, the southern tip of the peninsula is ideally suited to evaluate the spatial distribution of inner forearc deformation in response to seamount subduction. Over 30 radiocarbon dates from 2 extensive Holocene platforms are used to constrain the rates, style and timing of deformation along 20km stretches of orthogonal coastline. Ages range from 0.5ka to 2.9ka for the lower platform and from 3.5ka to 7.4ka for the higher platform. Maximum uplift rates of ~6.0m/ka occur along the southeastern tip of the peninsula and decrease linearly to <1m/ka along the 20km length of both coastlines and thus landward from the Middle America Trench and away from the line of subducting seamounts. This >400km2 area is rotating as a block with an angular rotation rate of 0.02o/ka about an axis with an azimuth of 80o. Calculated rotation and uplift rates are consistent with the elevation and <20o dip of the Cobano surface, the oxygen isotope stage 5e highstand at 125ka. Given the 2o to 5o dip of the Plio-Pleistocene Montezuma Formation, this deformation style is limited to <~250ky and may be occurring in response to seamount underplating onto the Caribbean plate.

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