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Recent Tectonics in the Continental Slope Along the Gulf of Tehuantepec Derived From Seismic Reflection and Multibeam Data

Details

Meeting	2007 Joint Assembly
Section	Tectonophysics
Session	Mexican and Central American Subduction Zones: Bringing Together Seismology, Petrology, Geology, Tectonics and Geodynamics II: Posters
Identifier	T51A-05 Mortera-Gutierrez, C A*, Universidad Nacional Autónoma de México, UNAM - Instituto de Geofísica, Coyoacan, DF 04510, Mexico Bandy, W L, Universidad Nacional Autónoma de México, UNAM - Instituto de Geofísica, Coyoacan, DF 04510, Mexico Romahn-Reynoso, S, Universidad Nacional Autónoma de México, UNAM - Instituto de Geofísica, Coyoacan, DF 04510, Mexico Ortega-Ramírez, J, Instituto Nacional de Antropología e Historia, INAH - Laboratorio de Geofísica, Cuauhtemoc, DF , Mexico
Authors	Pisias, N G, Oregon State University, OSU - College of Oceanic and Atmospheric Science, Corvallis, OR , United States Mix, A C, Oregon State University, OSU - College of Oceanic and Atmospheric Science, Corvallis, OR , United States Goldfinger, C, Oregon State University, OSU - College of Oceanic and Atmospheric Science, Corvallis, OR , United States Lyle, M, Boise State University, BSU - Department of Geosciences, Boise, ID , United States Liberty, L, Boise State University, BSU - Department of Geosciences, Boise, ID , United States Seafloor morphology, geology, and geophysics [3045] Submarine landslides [3070]
Index Terms	Submarine tectonics and volcanism [3075] Continental margins: convergent [8104] Continental margins: transform [8106]

Abstract

During May 2000, the NEMO Expedition, Leg III on board the RV Melville was carried out at the Gulf of

Tehuantepec with the goals to locate undisturbed sediment sites for a climate change study along depth transects at the eastern tropical Pacific margin. One of the depth transect was done across the continental slope in front the west coast of Mexico. To carry this transect, the seafloor relief was surveyed with a SEABEAM 2000 multibeam, and the subbottom sediment layers were digital seismic imaged with a 2 GI AIRGUN and 4 multichannel system. After the cruise, the multibeam bathymetric map clearly shows evidence of massif slumps disturbing the slope, one large surface fault and multiple long canyons transversal to the slope, between 200 m and 2,500 m depth. A standard post-processing of sixteen seismic reflection profiles were done at the UNAM Marine Geophysics Lab for the analysis of the tectonics structures at the continental margin, near the location where the Tehuantepec Ridge converges into the Middle America Trench and the proposed North American- Caribbean plate boundary intersecting the trench. Mayor recent tectonic structures (faults and filled sediment basins) identified in the seismic sections are well correlated with the surface evidence of the continental slope failure at the Gulf of Tehuantepec. This examination evidences a recent large submarine landslide that was originated by a slope failure in the upper slope, near the foot of the shelf, forming a horse-shoe shape basin (extending 23 km crosswise and 11 km parallel to the slope trend). This massif landslide carried out 23 cubic km of sediments and fill completely the horse-shoe basin. Also this survey provide evidences of recent active faulting across the upper slope, indicating that the slope stability in the Gulf of Tehuantepec is largely affected by the tectonics adjacent to the marine intersection of the Caribbean-North America-Pacific plate boundary. This slope stability should be considered as a potential geohazardous zone that could generate regional or local tsunamis, affecting the coasts of Mexico and Central America.

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