

コスタリカ沈み込み帯における応力と歪みの時空間変化：IODP Exp. 334, 344 速報 Preliminary results of stress and strain analyses, IODP Expeditions 334 and 344, Costa Rica Seismogenesis Project (CRISP)

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The Costa Rica Seismogenesis Project (CRISP) is designed to understand the processes that control nucleation and seismic rupture of large earthquakes at erosional subduction zones. Integrated Ocean Drilling Program (IODP) Expeditions 334 and 344 penetrated the middle slope at Sites U1378 and 1380, the upper slope at Sites U1379 and U1413, the frontal prism at Site U1412, and input sites at Sites U1381 and U1414.

Stress and strain analyses using anelastic strain recovery (ASR), fault kinematics, and anisotropy of magnetic susceptibility (AMS) have been conducted in the middle and the upper slope. Based on ASR analyses during Expedition 334, a clear difference in present-days stress state between the slope sediments and the basement were identified at Site U1379: A normal-fault stress regime characterizes the slope sediments, whereas a strike-slip regime corresponds to the basement. On the other hand, the stress-states in the slope sediments at Sites U1378 and U1380 are characterized by a strike-slip regime that has Sigma 2 oriented vertically. The Sigma 1 direction is oriented NNW-SSE, which corresponds to the SHmax direction identified in the logging while drilling (LWD), parallel to the present GPS direction. In contrast to the present-day stress state, the ancient stress and strain based on onboard fault kinematics during both expeditions and AMS were controlled by direction of plate subduction (Sigma 1 oriented to the vertical, whereas Sigma 2 oriented NW-SE). The spatial and time variations in stress state along the CRISP transect plausibly correspond to the stress variations during earthquake cycles. Preliminary ASR and AMS results will be incorporated into this study.

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