



High heat flow and gas discharge in a nascent spreading center in the northern Gulf of California

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Recently acquired heat flow data indicate that the Wagner and Consag basins in the northern Gulf of California are tectonically active and may be considered as a continuation of the seafloor spreading and rifting that has been documented in several basins in the central and southern parts of the Gulf. The detailed bathymetry of the Wagner and Consag Basins shows the steep eastern edge of the basins bordered by the Wagner Fault. Bathymetry and profiler data revealed large vertical displacements due to faulting that disrupted the sedimentary column. The Wagner and Consag Basins have similarities to the other well-studied marine basins along the broader San Andreas transform-fault and Gulf of California plate boundary system; the sediment-filled, fault-bounded, basins of the Southern California Borderland have high heat flow due to crustal thinning and show fluid venting along faults with deposition of large barite deposits. The area of the Wagner Fault shows venting of gaseous CO₂ and CH₄ in abundant flares that have been recorded by echosounder and bottom profiler.

The measured temperature gradients are generally above 50°C/100m, and only the central part of the basins presents low temperature gradients. The temperature anomalies are correlated with high concentrations of Ba in the sediments and dissolved ²²²Rn in near bottom water samples. Highest temperature gradients are observed in the graben borders associated with the most intensive gas discharge features.