



## Heat flow and thermal regime in the Guaymas Basin, Gulf of California: Estimates of conductive and advective heat transport

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Heat flow is estimated at eight sites drilled during Integrated Ocean Drilling Program (IODP) Expedition 385 in the sedimented Guaymas Basin, Gulf of California. One of the expedition objects was designed to understand the thermal regime of the basin and to better understand heat transfer mechanisms from sill intrusions into organic-rich sediment. Sedimentation corrections are significant and increase basin values of heat flow values on average by 12% and range from 119 to 221 mW/m<sup>2</sup> in the basin. Thermal analysis suggests that heat flow in the basin is distributed equally between conductive and advective heat transfer for plate ages older than 0.2 Ma. At Ringvent, Site U1547 a young sill intrusion is related to locally elevated heat flow displaying values between 257 and 1000 mW/m<sup>2</sup>. Thermal analysis of the five holes drilled at Site U1547 suggests that the sill structure hosts an active hydrothermal system. Our study suggests that rapidly cooling intrusion led to discharge velocities between 15 – 40 mm/yr and possibly recharge of the system may occur through normal faults. To be consistent with the heat output, we estimate the sill intrusion thickness to be ~240 m. The highly three-dimensional nature of the sill intrusion at Site U1547 and the question of its thickness add considerable complications which are currently investigated in complementary studies.

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