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Sedimentary infill at the western tip of the Gulf of Corinth during the last 120 ka: Evidence for an acceleration of the subsidence

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The Corinth Rift, Greece, is a young and active continental rift stretching over 150 km between the cities of Patras and Athens, and is partly covered by the sea forming the Gulf of Corinth. The present study is focused on the western tip of the Gulf, west of the town of Aigion, where the extension rate measured by GPS is the highest, reaching 14-16 mm/yr. The sediments were investigated using seismic reflection profiling (600 km) to characterize the evolution over the last 120 ka of the sedimentation, subsidence and faulting activity. We combined two lines of evidence, the position of lowstand deltas and isopach maps. The isopach maps were built using two stratigraphic markers could be traced through the seismic grid, the most recent one corresponds to the last post-glacial transgression and the antecedent one to MIS 6 / MIS 5 transgression, at ca. 130 ka. The related isopach maps evidence a spatial change in sedimentary infill along the rift axis probably related to a decrease in activity of the south-dipping faults (i.e. Trizonia/Mornos Faults) that formed the northern edge of the westernmost Corinth Rift in an early stage of the rifting. The different identified lowstand fluvio-deltaic deposits are related to global sea-level lowstands during which the Gulf of Corinth was a lake, whose last reconnection to the Sea occurred around 11.5 ka. Concerning lowstand deltas formed around 11.5 ka, the subsidence rates exceed 3 mm/yr and are maximal under the apex of the Mornos fan-delta (5.0-6.6 mm/yr) and in the hanging wall of the north-dipping Lambiri fault (5.9-7.5 mm/yr). Regarding the anterior lowstand delta, the subsidence was lower ranging from 1 to 2.7 mm/yr. These changes would arise because of the northward migration of the strain toward the north, e.g. the Marathias fault.

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