

**Oceanic rift-driven transition
from carbonate to biosilica
sedimentation in the western
Tethyan Lagonegro Basin
(southern Italy) during the Late
Triassic**

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The Lagonegro Basin was part of the southwestern branch of the western Tethys. The Upper Triassic Lagonegro succession is comprised of deep-marine sediments belonging to the Calcari con Selce (“Cherty Limestone”) Formation of late Ladinian to late Norian-early Rhaetian age and the Scisti Silicei (“Siliceous Shale”) Formation of late Norian-early Rhaetian to Late Jurassic age. The “Transitional Interval” between these two formations is gradational stratigraphically and diachronous across the basin. This transition was investigated in three sections (Pignola-Abriola, Monte Volturino, and Madonna del Sirino) representing a proximal-to-distal transect across the Lagonegro Basin. The shift from mainly calcareous to mainly siliceous sedimentation is inferred to have been influenced by rapid, post-rift subsidence of the Lagonegro Basin. It also coincided with a shift to warmer, more humid conditions around the Norian/Rhaetian boundary, as reflected in a pronounced increase in the chemical index of alteration (CIA), a weathering proxy. Redox proxies indicate mainly oxic conditions in the deep basin, although organic-rich shale beds are present at multiple levels in the otherwise organic-poor succession. The abruptness of the transitions between organic-poor and -rich sediment layers suggests major changes in paleoceanographic conditions, possibly related to switches from lagoonal circulation (linked to a net negative water balance) to estuarine circulation (linked to a net positive water balance). We infer that the Transitional Interval was related primarily to rift-driven changes and secondarily to climate-driven hydrographic changes within the Lagonegro Basin.