The Norian–Rhaetian Boundary (Late Triassic) in Panthalassa: Macro- and Microfossil Perspectives

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The Norian–Rhaetian boundary is poorly understood in terms of diversity changes and large-scale environmental perturbations in marine systems. Significant faunal turnover is observed in several marine groups, including monotid bivalves, radiolarians, brachiopods, vertebrates, and ostracods, but difficulties in correlation have inhibited efforts to establish causal relationships. Here we present shallow marine faunal data from invertebrate macrofossils and both vertebrate and invertebrate microfossils from the New York Canyon area (west-central Nevada). The Mount Hyatt Member of the Gabbs Formation was deposited during the middle-late Norian to earliest Jurassic, and the Norian–Rhaetian boundary can be recognized with 87Sr/86Sr chemostratigraphy.

Shelly invertebrate macrofossils are diverse and abundant in Late Norian deposits, with a wide range of paleoecological life modes represented, including burrowers, recliners, and early cementing clams (e.g.: *cf. Newaagia*). Early Rhaetian assemblages exhibit lower diversity and more restricted ranges of ecological modes, primarily burrowing. The microfossil survey provides information on different taxa with lower macroscopic preservation potential: Late Norian biosediment assemblages are dominated by echinoderm fragments (stereom) and molluscs, which decline across the Norian–Rhaetian boundary and are replaced by lithistid sponge desma, hexactinellid sponge spicules, and ostracods. Ichthyolith (vertebrate microfossils) diversity does not appear to change across the boundary, although specimens are somewhat less common in early Rhaetian sediments and are likely to represent depositional signals like condensation horizons.

These results highlight the importance of dual macro- and microfossil surveys in establishing faunal and paleoecological patterns, the clear signal of faunal change in eastern Panthalassa across the Norian–Rhaetian boundary, and the non-dominant presence of silica-limited sponges in shallow marine environments prior to the glass ramps of the Early Jurassic.