



High sedimentation rates in the Early Triassic after latest Permian mass extinction: Carbonate production is main factor in non-Arctic regions

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A substantial change in sedimentation rates towards higher values has been documented from the Late Permian to the Lower Triassic. Although it is assumed and also has been shown that the deposition of siliciclastic material increased in the Lower Triassic due to stronger erosion because of loss of land cover and increased chemical and physical weathering with extreme climate warming, the main sediment production occurred by marine carbonate production. Still, carbonate production might have been significantly influenced by weathering and erosion in the hinterland, as the transport of dust by storms into the ocean water probably was a main nutrient source for microbial carbonate producers, because “normal” nutrient supply by ocean circulation, i. e. upwelling was strongly reduced due to the elevated temperatures resulting in water-column stratification. Sediment accumulation was also clearly influenced by the paleo-geographic and latitudinal position, with lower carbonate production and sedimentation rates in moderate latitudes.

The existence of a “boundary clay” and microbial carbonate mounds and layers in the immediate aftermath of the latest Permian mass extinction points towards a development from a short-timed acid ocean water – resulting in a carbonate production gap and the deposition of the boundary clay towards the deposition of the microbial mounds and layers due to the microbial production of micro-environments with higher alkalinity allowing the production of carbonate. After the return of the ocean water to normal alkalinity planktic production of carbonate resulted in a very high sedimentation rate, especially taking into account the absence of carbonate producing eukaryotic algae and animals.