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Mass-wasting triggered by the end-Triassic mass-extinction

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The end-Triassic dieback of tree-forming vegetation across NW Europe and the proliferation of a low-growing herbaceous pioneer vegetation composed of ferns and fern allies, likely had a major impact on weathering and erosion of emerged land masses. In a recently drilled core from northern Germany (Schandelah), palynological analyses provide evidence for this scenario. The uppermost Rhaetian Triletes Beds show increasing amounts of reworked Palaeozoic acritarchs and prasinophytes of up to 30% of the palynomorph fraction. Most of the acritarchs are singletons and can be assigned to Ordovician and Silurian species, such as Ankyrotrochus crispum, Oppilatala eoplanktonica, and Evittia spp. The average age of the reworked acritarch assemblages is observed to increase during the latest Rhaetian, leading to an inverted stratigraphy among Palaeozoic species. Further North, in the Stenlille cores from the Danish Basin, reworked Palaeozoic palynomorphs appear to constitute mainly sphaeromorphic prasinophytes and other Palaeozoic microfossils such as chitinozoans and carboniferous spores. Further south, at Mingolsheim (S Germany) the Triletes Beds contain a clear sign of soil reworking, including mycorrhizal fungal remains and cysts from probable soil organisms. These peculiar changes in palynological assemblages go hand-in-hand with important changes in sedimentology. The reworking of soil and bedrock is occurring in an interval that also contains evidence for earthquake activity in the form of widespread seismites. All these observations may be attributed to a number of mutually non-exclusive mechanisms, including decreased plant cover, an intensified hydrological cycle due to greenhouse warming, and the doming of the Central Atlantic Magmatic Province leading to continental-scale tectonic steepening of basin margins.