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Weathering processes in clayey sediments - on local to catchment scale

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In Denmark, postglacial weathering processes have introduced considerable changes in the inherited properties of the young sediments of Weichselian age. Over the last 12.000 years, oxidation and acidification are the main responsible processes for the changes that have taken place in water recharge areas. The distribution of nitrate has been shown to be closely related to the geochemical environment above the interface between the oxidized and reduced sediments and present in the oxic environment only. In the present study, the formation of oxidized geochemical environments was studied at different scales, from local to catchment scale, in areas dominated by clayey till. Sediment samples were collected in the field from surface and down to below the redox interface and described by color, redoximorphic features, and sediment type and analyzed for e.g., total amount of reduced compounds and reduced compounds (pyrite, ferrous iron, and organic matter). The results were used to describe the spatial development of oxidized environments and to identify the smallest possible scale at witch nitrate reduction in the subsurface can be assessed for Danish catchments.