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Veränderter Lebensraum – gestern, heute und morgen

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Early Pleistocene Fluvial History of the Rhine-Meuse in the Southern North Sea Basin (Netherlands)

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The fluvial history of the southeastern part of the Netherlands shows interplay of three main river systems: Rhine, Meuse and smaller rivers draining the central and northern part of Belgium. Downstream of their confluence, north of Aachen, deposits of Rhine and Meuse are mixed in both Pliocene and Early Pleistocene. Due to a marked change in the lithological and petrographical composition the Upper Pliocene and Lower Pleistocene deposits of the Rhine-Meuse system can be mapped separately from deposits supplied by the northeast draining of rivers coming from Belgium.

Recently revised lithostratigraphical schemes in Germany and the Netherlands resulted in a consistent lithostratigraphical framework that strongly constrains the interrelationship of the fluvial deposits supplied by the Rhine, Meuse, and the Belgian rivers. Tectonics and sea-level movements had a strong control on the Early Pleistocene sedimentation pattern. Up to 120 m thick fluvial deposits occur in the generally subsiding Roer Valley Graben, one of the main tectonic structures in the southern Netherlands. This sequence of fluvial deposits is interrupted by a wedge of shallow marine deposits. However, the general picture of the sedimentation pattern is that the ratio between accommodation space and sediment supply is low during the larger part of the Early Pleistocene. A feature probably related to the position of the southern part of the Netherlands at or nearby the hinge line of the North Sea Basin. In particular during periods of low sea-level, sediments of the Rhine-Meuse system by-passed the southern Netherlands and were deposited further to the north in the North Sea Basin. As a result, the preserved fluvial sequences appear to be discontinuous and may reflect only fragmentary parts of the Early Pleistocene. In the North and Northwest of the Roer Valley Graben the Rhine-Meuse system became part of the vast fluvio-deltaic system of the Eridanos. This major fluvial system originated in the Baltic area and transported huge amounts of sediments into the North Sea Basin from about the Middle Miocene until its starvation at the end of the Early Pleistocene.

Time control on the Early Pleistocene Rhine-Meuse sequences in the Netherlands is poor and traditionally based on pollen-defined stages and substages. It will be discussed that such correlations are much more complex than hitherto thought. Within the stacked fluvial deposits a repetition of similar pollen assemblages occurs while existing gaps are hard to identify. Therefore it is questionable if the discontinuous fluvial record of the Roer Valley Graben can provide a reliable framework for the chronostratigraphical subdivision of the Early Pleistocene.

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