

# Architecture of the Eemian interglacial Rhine record

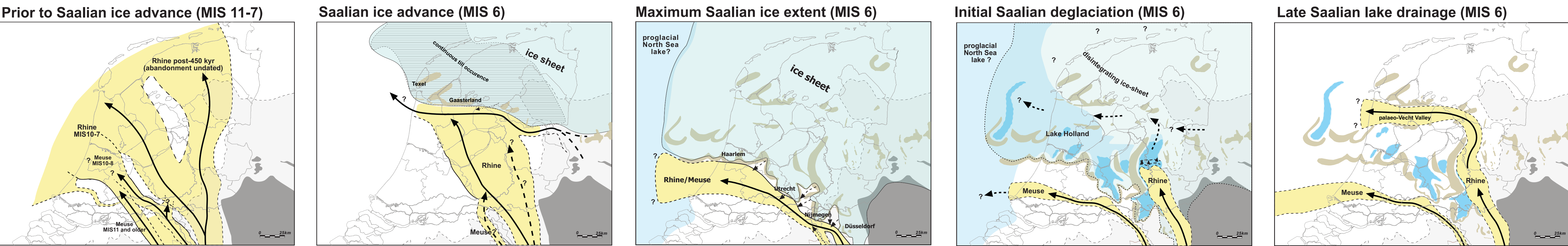
## Fluvial evolution of the River Rhine during the last interglacial-glacial cycle in the southern North Sea Basin

Palaeogeography

Estuary

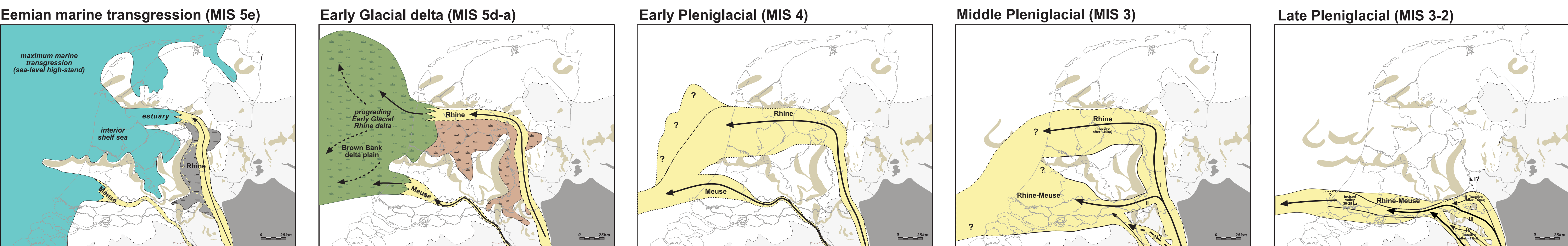
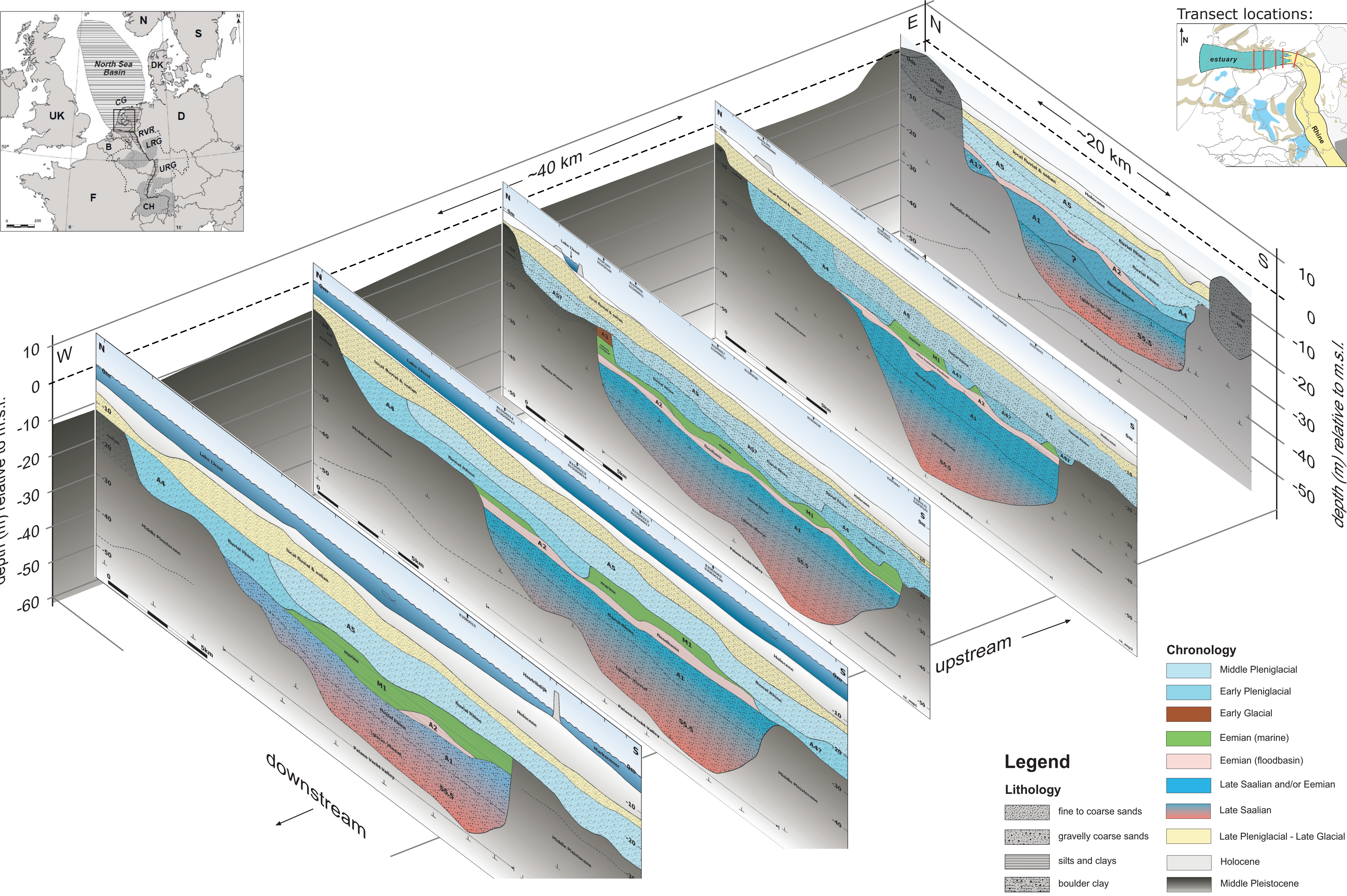
Incised-valley

Eemian



**Sedimentary architecture.** The Eemian interglacial (MIS 5e) lower Rhine delta is situated in the central Netherlands and buries an incised valley originating from the preceding glacial period (MIS 6), where it incised into older Middle Pleistocene sediments (MIS 11-7).

After initial incision the valley became directly partly filled with coarse-grained glacio-fluvial deposits (**Unit S5.5**). Deposition of coarse material continued during the Late Saalian into the early Eemian interglacial (**Unit A1**). Later in the Eemian interglacial, flood basin fines were deposited (**Unit A2**), spanning the major part of the incised-valley. These fresh-water deposits gradually show more marine influence towards their top and finally prograde into a transgressive shell-rich estuarine sequence (**Unit M1**), deposited during the Eemian sea-level high-stand. Later deposited organic-rich Early Glacial Rhine delta sediments (**Unit A3**), together with the interglacial sediments, are widely eroded and covered by younger coarse-grained Rhine sediments (**Unit A4** and **Unit A5**) during the Early- to Middle Pleniglacial. The sedimentary sequence is capped by deposits of more local fluvial and eolian origin during the Late (Pleni-)Glacial and lagoonal and fluvio-deltaic deposits during the Holocene.



Legend

- Channel belt
- Flood basin (clastic)
- Flood basin (peat)
- Brackish lacustro-deltaic
- Ice sheet
- Subglacial basins
- Proglacial lake
- High-stand sea
- Glacio-tectonic ridges
- Paleozoic outcrops
- Present >10m a.s.l.

Peeters et al., 2015



Within near-coastal environments, the fluvial-tidal transition zone is one of the most complex zones due to the mixture of processes and sediments of different sources and depostyles.

The Eemian interglacial (ca. 120 ka BP) Rhine record in The Netherlands constitutes a promising natural archive for improving our understanding of lower deltaic architecture and palaeogeography. Besides, the well investigated Holocene Rhine delta is available for analogue studies and to directly test concepts of preservation.

Comparing the Eemian interglacial and Holocene Rhine fluvial-estuarine transition zones, will lead to better insight in the development of lower-deltaic areas and hence of better understanding the sedimentary architecture of hydrocarbon reservoir systems.

Peeters, J., Busschers, F.S., Stouthamer, E., 2015. Fluvial evolution of the Rhine during the last interglacial-glacial cycle in the southern North Sea basin: A review and look forward. Quaternary International 357, 176-188. <http://dx.doi.org/10.1016/j.quaint.2014.03.024>

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