Late Holocene coastal plain evolution in the Netherlands

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In Late Holocene coastal plains significant landscape developments took place, partly due to natural factors, but they were also affected by human activities. The coastal segments that make up the Dutch coast, each had a distinct evolution over the last 2500 years. Abundant geological and archaeological data allows to review and compare this evolution in detail.

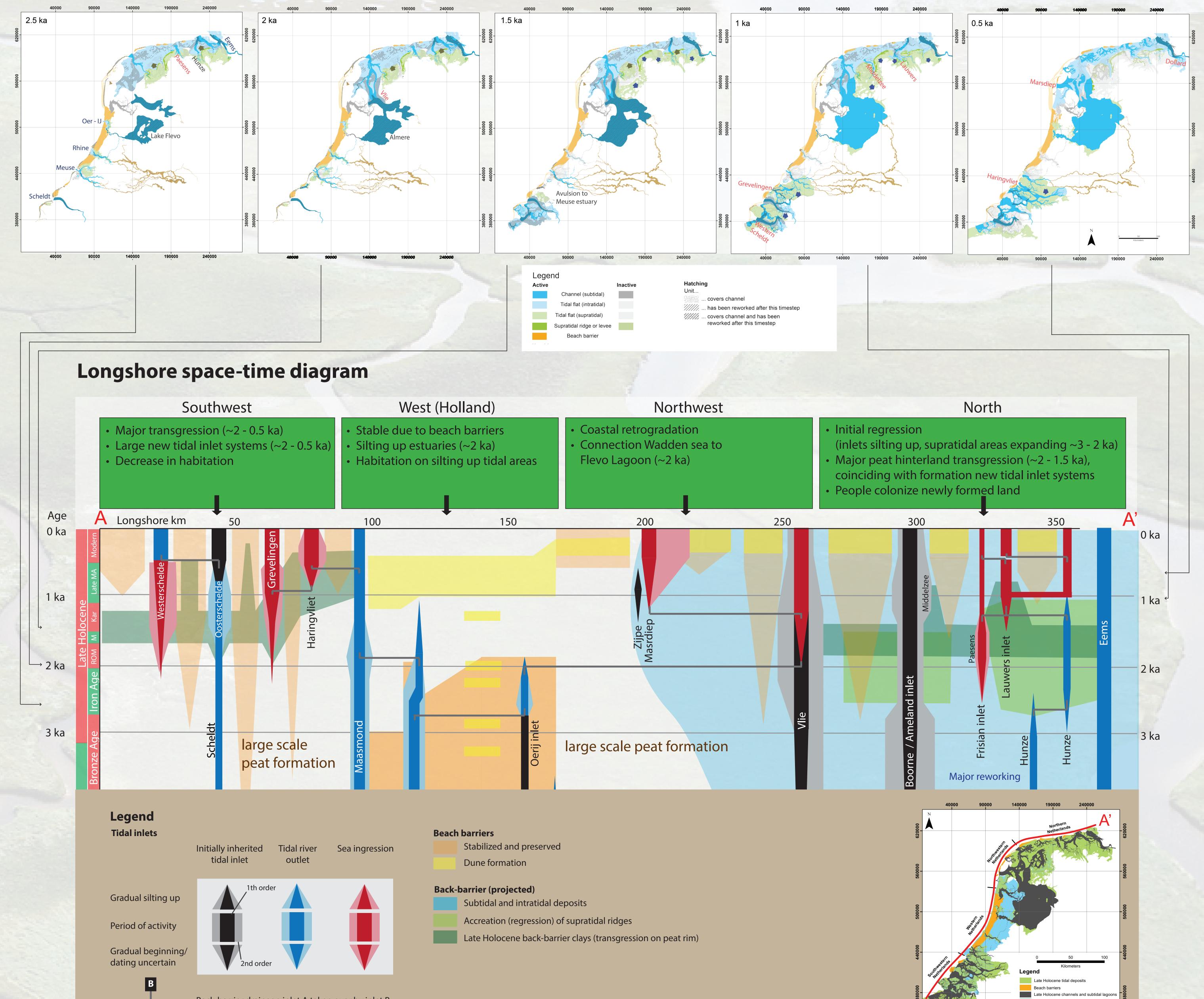
We consider processes from the marine realm and from the hinterland, with natural and human-induced forcings. Feedbacks between these protecting landscape elements, the degree of peat land loss and human occupation are evident from details in the Late Holocene evolution.

From 5 to 2.5 ka, the coastal evolution in most coastal segments was essentially characterised by stabilisation. Under steadily decreasing rates of sea level rise a matured barrier system

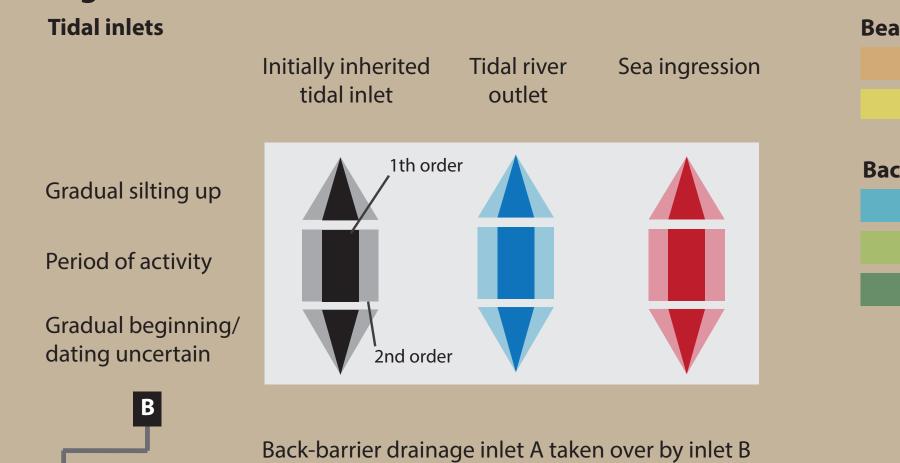
protected a wide back-barrier area that saw extensive peat formation. In the last 2.5 ka however, large areas of the coastal plain area became ingressed and marine inundated, mainly as a consequence of human reclamation. Especially the peat lands in coastal segments with narrow beach barriers were more sensitive to flooding and ingression. These saw series of new tidal inlet systems develop that partly silted up again.

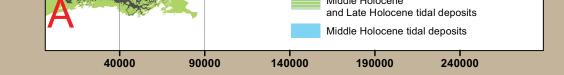
Coastal segments that had received abundant fluvial and marine sediment supply in times before, were much less affected by Late Holocene ingressions. The wide barrier complex and tidal-river levee systems in the back-barrier area helped preventing ingression. In the Northern Netherlands, accretion of salt marsh ridges took place half way in the back-barrier area, while regional ingression and loss of peat land occurred in further inland areas.

Palaeogeographical development









Conclusions

Α

- Late Holocene transgressions were mainly forced by subsidence as a consequence of cultivation and reclamation of the coastal peat rim area.
- Late Holocene storm-surge erosion paths at new locations become ingressions because peat rim subsidence enlarged the tidal volume.
- Tidal-river outlets were inherited from the Middle Holocene, their position could change due to capture by landward extending sea ingressions or avulsion. Coastal segments react differently on reclamation activities mainly because of
- their inherited Holocene geological situation.

Additional information



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