



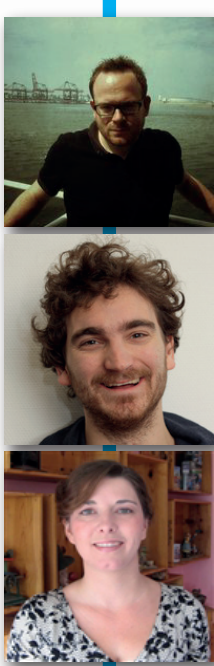
The Dark Age of the Lowlands in an interdisciplinary light:
people, landscape and climate in the Netherlands between AD 300 and 1000

The Dark Age of the Lowlands in an Interdisciplinary Light

People, landscape and climate between AD 300 and 1000

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Introduction

The late-Roman period (AD 270-450) and Early Middle Ages (AD 450-1050) in the Netherlands witnessed major changes in landscape, economy, demography and possibly also climate. Archaeological evidence throughout north-western Europe, including the Netherlands, indicates changing settlement patterns and severe demographic decline in the late-Roman and post-Roman periods. To fully understand the processes behind these changes, it is necessary to combine datasets of archaeology, geomorphology, past climate and vegetation.

Method

Our research programme focuses on analysing and reconstructing the complex and dynamic interplay between cultural, landscape and vegetation changes during Roman and early-medieval periods. These reconstructions take place within three complementary PhD-projects, in the realms of archaeology (subproject A), physical geography (subproject B) and palaeoecology (subproject C). Subproject A focuses on occupation patterns (e.g. historical route networks, long-distance trade relations, settlement patterns) and land use in the river and Pleistocene sandy regions. Subproject B studies natural geomorphological landscape dynamics in the Netherlands, and sub-project C focuses on vegetation developments and climatic changes during these periods. The interaction between these subprojects is not only achieved by comparing synthesised datasets, but also by studying common and complementary research questions.



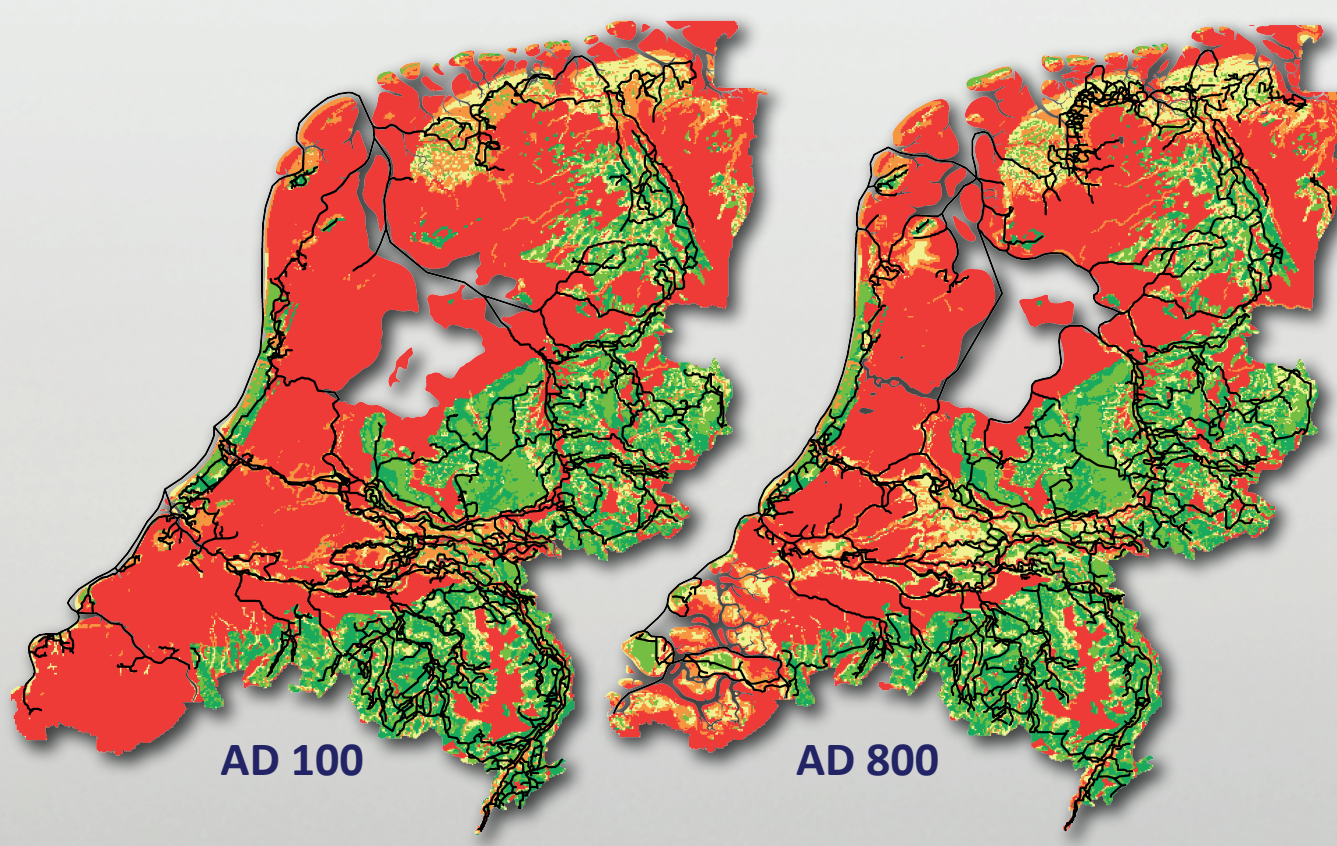
The dark age of the Lowlands in an interdisciplinary light
(project website)



References

Modelling historical routes

Project A



Left: Network-friction maps and Roman and early-medieval route networks (Van Lanen et al., 2015a/b).

Below: Route-network persistence between Roman (ROM), early-medieval periods (EMA) and AD 1600 (Van Lanen et al., submitted)

Human influence on coastal plain development

Landscape reconstruction coastal plain

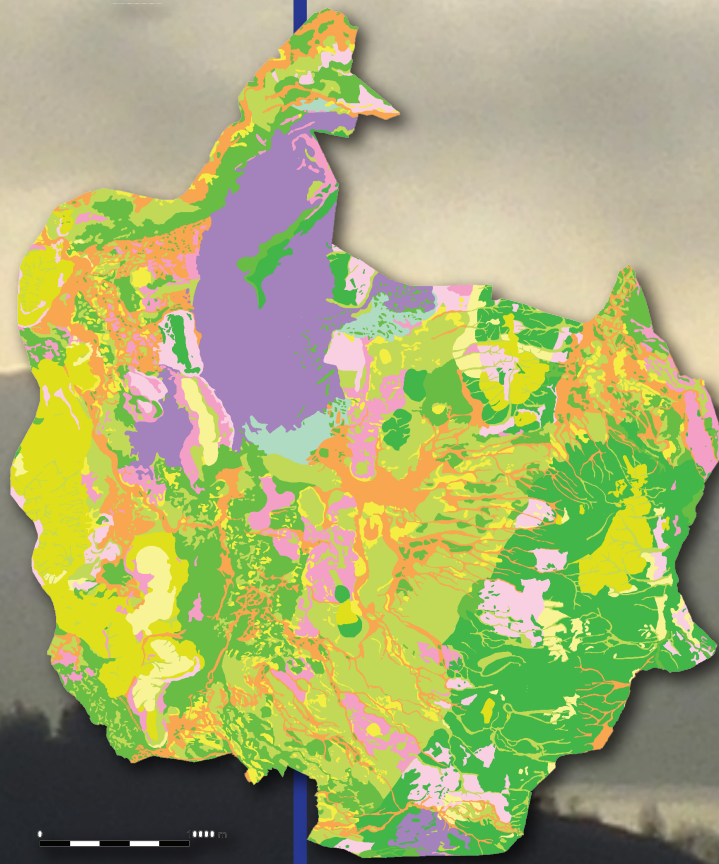
AD 1

AD 500

AD 1000

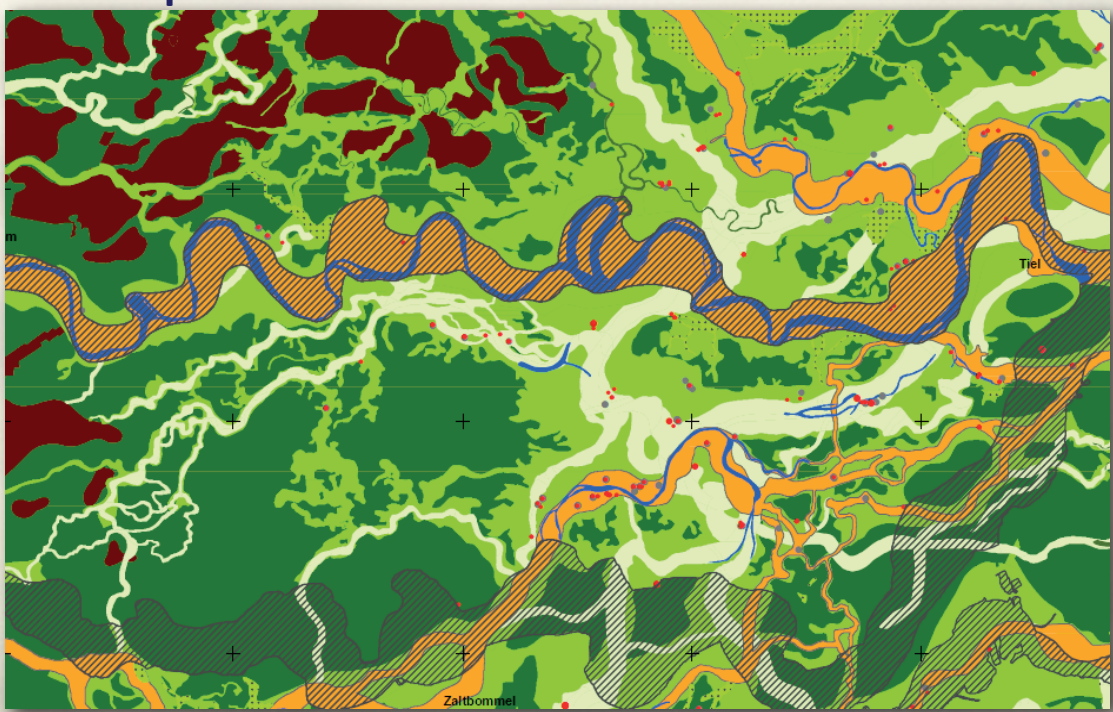
Project C

Vegetation reconstruction map Roman Period

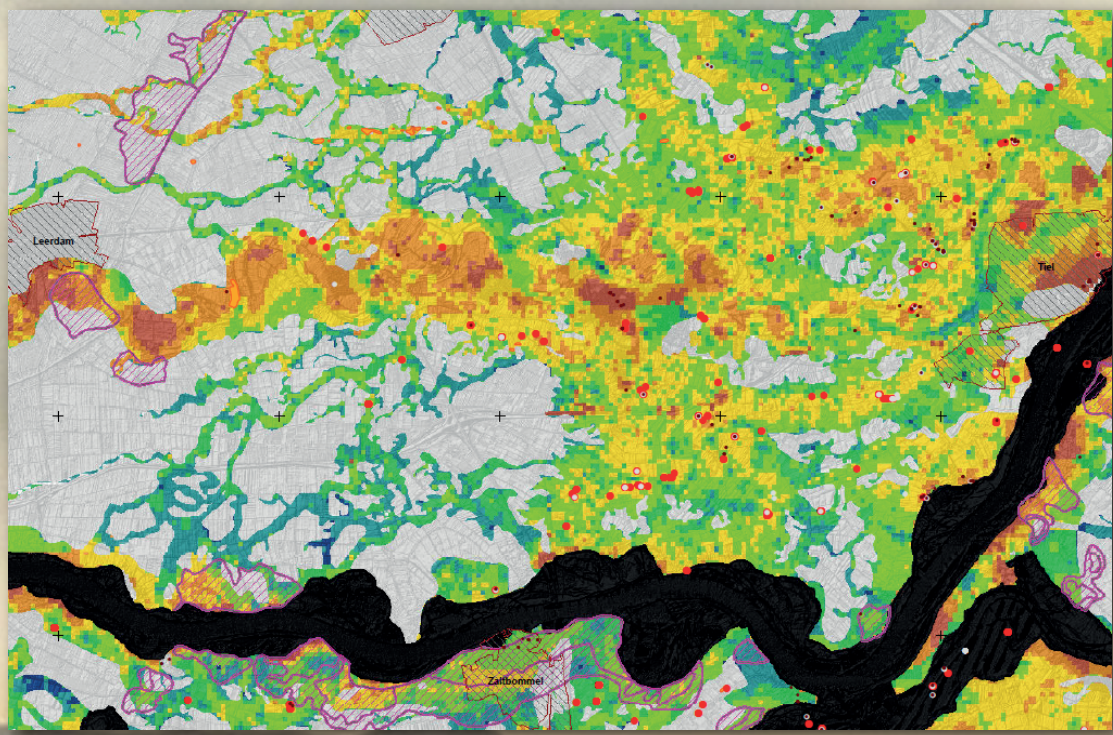


Influence landscape on settlement distribution

Landscape reconstruction in the delta

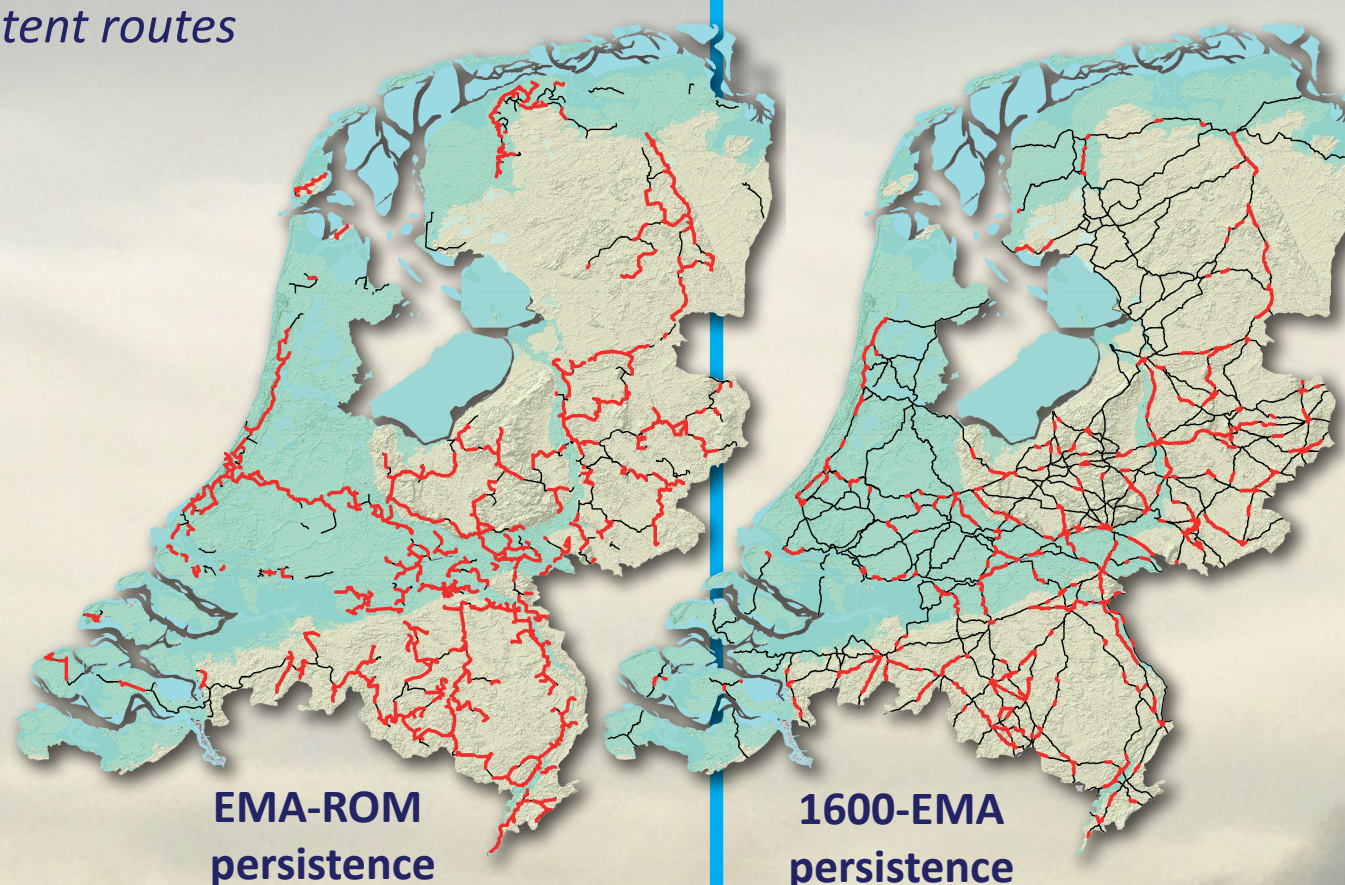


Palaeo-elevation in the delta



Calculating persistent routes

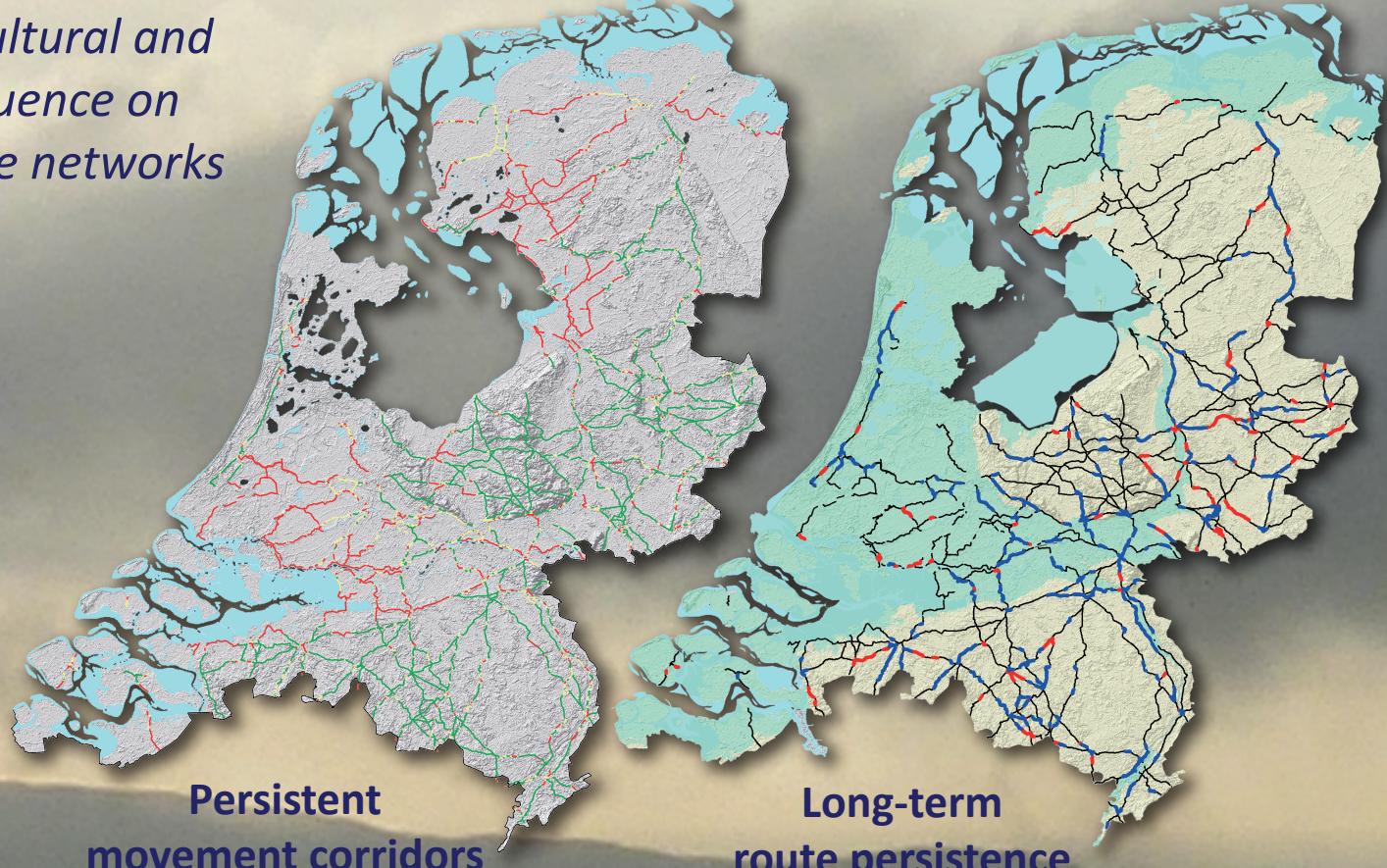
Project B



EMA-ROM persistence

1600-EMA persistence

Quantifying cultural and landscape influence on changing route networks



Persistent movement corridors

Long-term route persistence

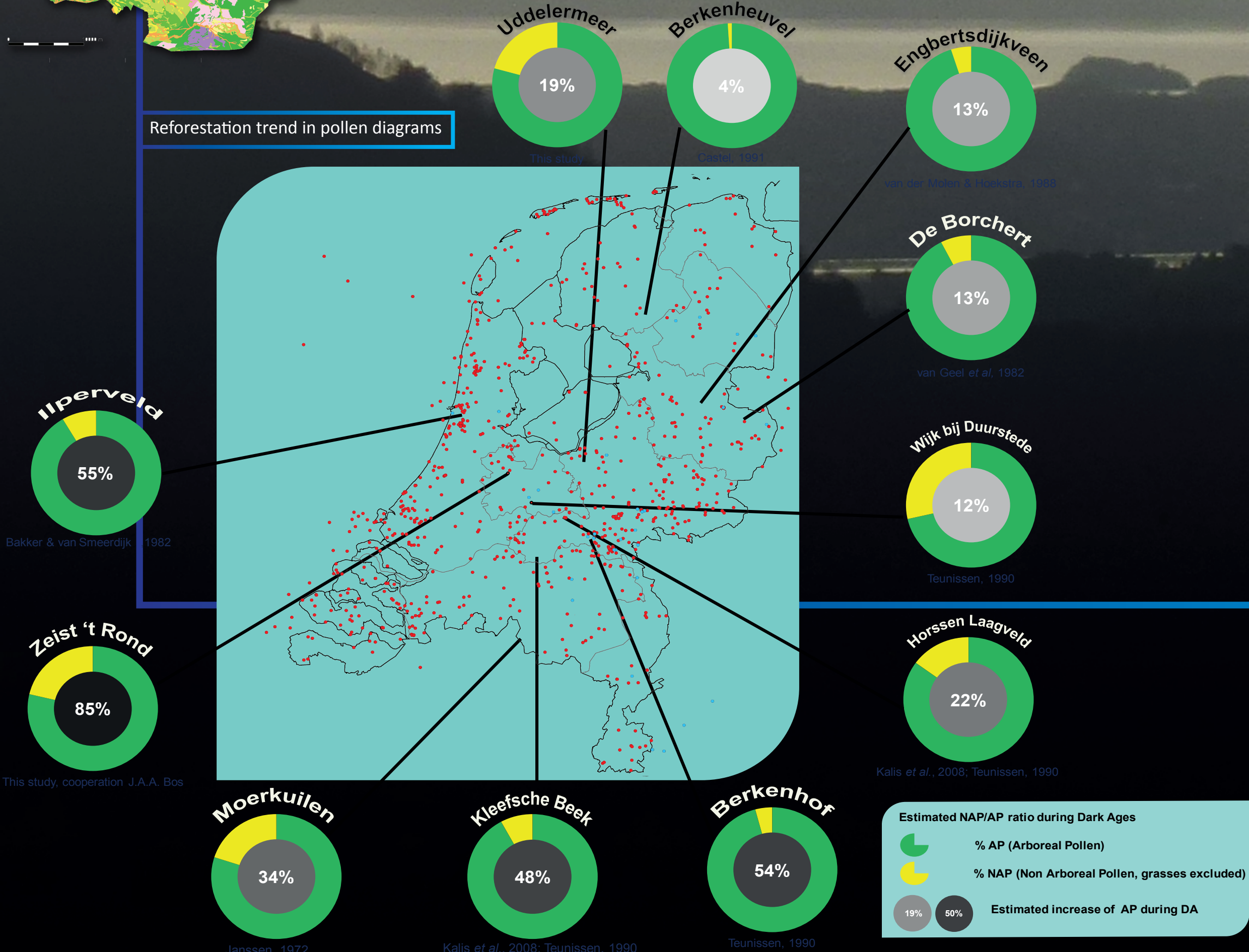
Results

For both the delta plain and the coastal area an innovative GIS was built including all deposits of Late Holocene age. Using this GIS, new detailed palaeogeographical maps of the delta plain area were made and combined with surface elevation reconstructions. When these maps were combined with settlement data, they showed that settlements preferentially persisted on the higher elevated areas in the landscape. Additionally, a palaeogeographical GIS was used to visualise storm surge sea ingressions in the Dutch coastal area during different time steps. Again these detailed landscape reconstruction were combined with settlement patterns (subproject A), this comparison demonstrated that anthropogenic induced flooding occurred at a dramatic scale. By comparing different sections along the coast it is shown that areas with wide peat areas and few beach barriers faced the most dramatic consequences of these flooding events.

The palynological records reflects the Late Roman period as a reforestation phase. This reforestation is most pronounced in the southern part of the Netherlands. Not only is this reforestation the result of a decrease in population, less intensive farming practices seem to be an additional factor. Using all available palynological data and abiotic landscape maps vegetation reconstructions are made for three time slices showing the shifting vegetation patterns (van Beek et al., 2015; Bouman et al., 2013).

On a supra-regional scale historical route networks in the Netherlands both in the Roman period and Early Middle Ages have a clear link to landscape settings. As such these networks can be modelled using detailed geoscientific and archaeological data (Van Lanen et al., 2015a). Validation of these models using archaeological data showed that over 89% of the Roman and 83% of the early-medieval routes could be correctly modelled (Van Lanen et al., 2015b) and almost 25% of these routes are persistent to at least the period around AD 1600 (Van Lanen et al., submitted).

The final results of the project will be synthesized in an interdisciplinary reconstruction of the dynamic interactions between cultural and landscape factors between AD 300 and 1000 in the Lowlands and a broader northwest-European context. The study will greatly improve our understanding of the development of the early-medieval Lowlands and strongly enhance the scientific framework for future research to this key period.



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