

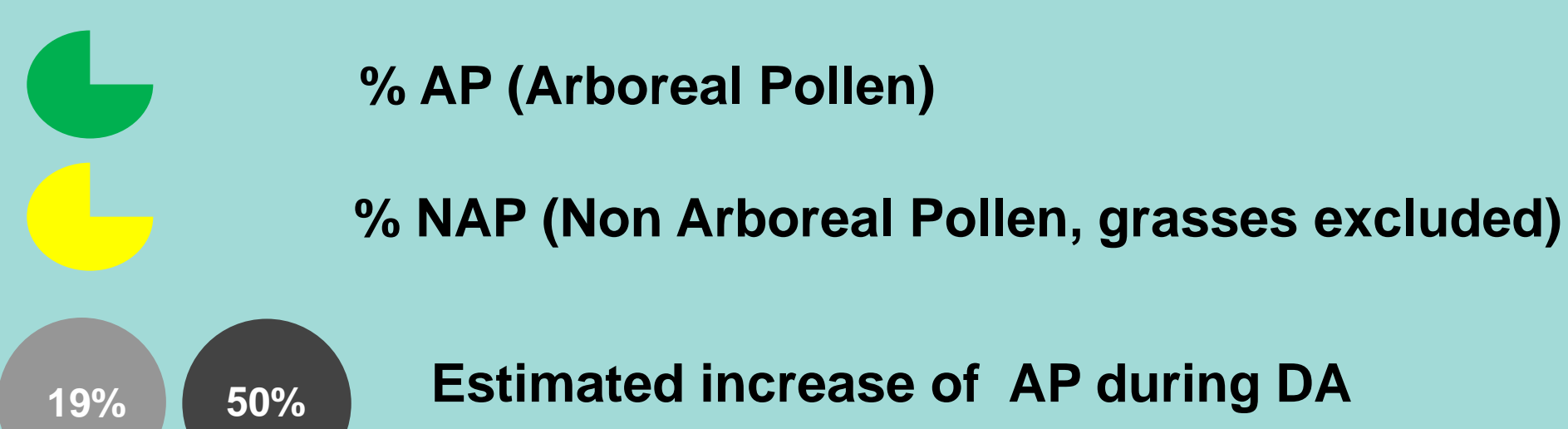
# 40 shades of black

## Regional differences in vegetation response to a changing human influence in the Low Countries during the Dark Ages (AD 300-1000)

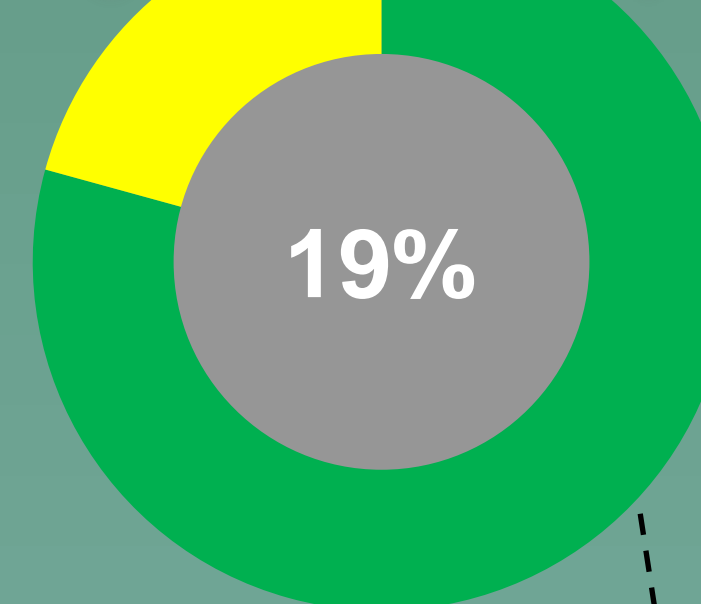
**Marjolein T.I.J. Gouw-Bouman<sup>1,\*</sup>, Timme H. Donders<sup>1</sup> and Wim Z. Hoek<sup>1</sup>**

**During the Dark Ages (DA)**, which includes the Late Roman Period (LRP) 300-500 AD and the Early Middle Ages (EMA) 500-1000 AD, large scale vegetation development is characterized by a forest regeneration. This phase of forest development is a reversal of the deforestation-trend that started in most areas during the Bronze age and reached its maximum during the Iron age (IA) to Middle Roman period (MRP). The Dark Age vegetation redevelopment phase was not uniform across the Netherlands. For a first overview of the spatial variation in vegetation development available Subatlantic pollen records were collected (current count 500 records). From this Subatlantic pollendatabase a selection was made of pollen records which cover the Iron age, Roman period and Early Middle ages. From each of these sites the ratio between Arboreal (AP) and Non Arboreal Pollen (NAP) was estimated from the original diagrams for both the period of maximum reforestation (DA) as the preceding maximum of deforestation (IA/MRP). Based on these ratios the amount of forest regeneration in the Dark Ages was calculated for each site as a growth percentage. Together with the ratio of AP/NAP during the DA this gives a first insight in the regional variations in vegetation development and a quantification of the Dark Age forest redevelopment in the Netherlands. These first results show that forest redevelopment was more severe in the southern and central part than in the eastern and northern part of the Netherlands. In a later stage these spatial differences in vegetation development will also be compared to climatic, geomorphological and archaeological records to further understand the factors controlling vegetation development and eventually quantify the human influence on the landscape.

Estimated NAP/AP ratio during Dark Ages

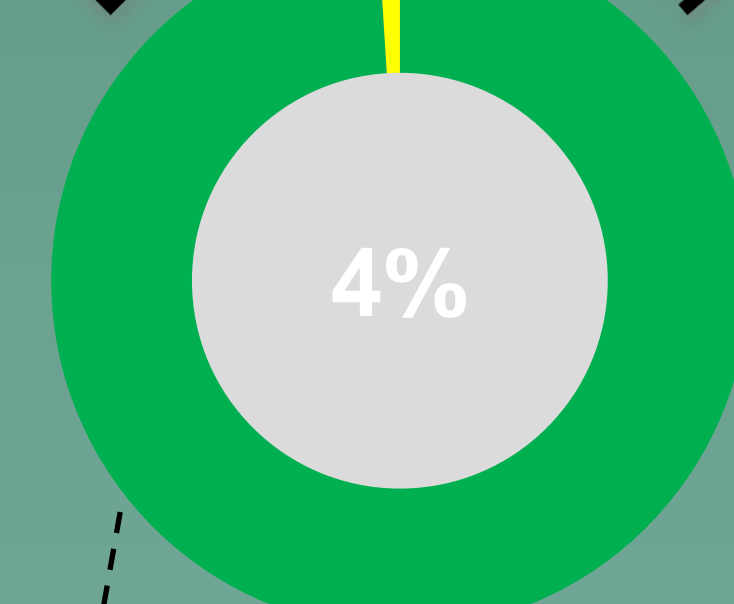


Uddelermeer



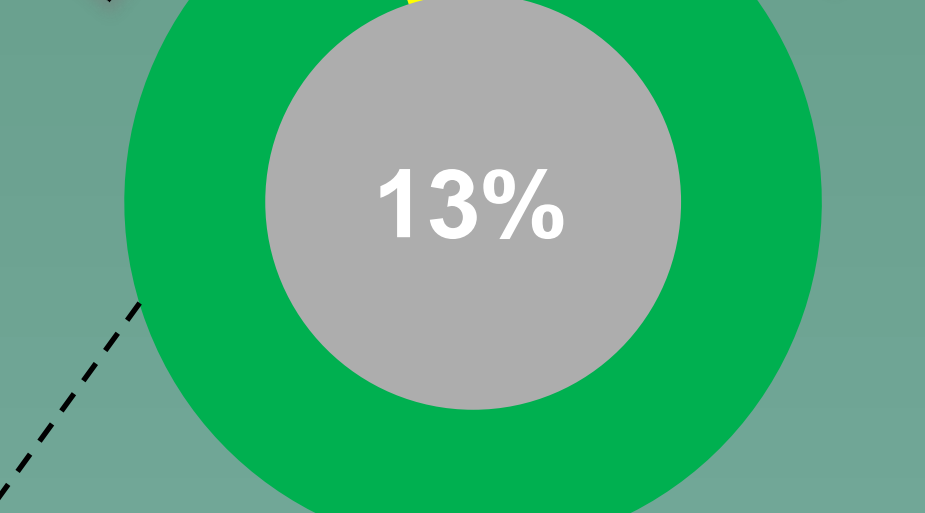
This study

Berkenheuvel



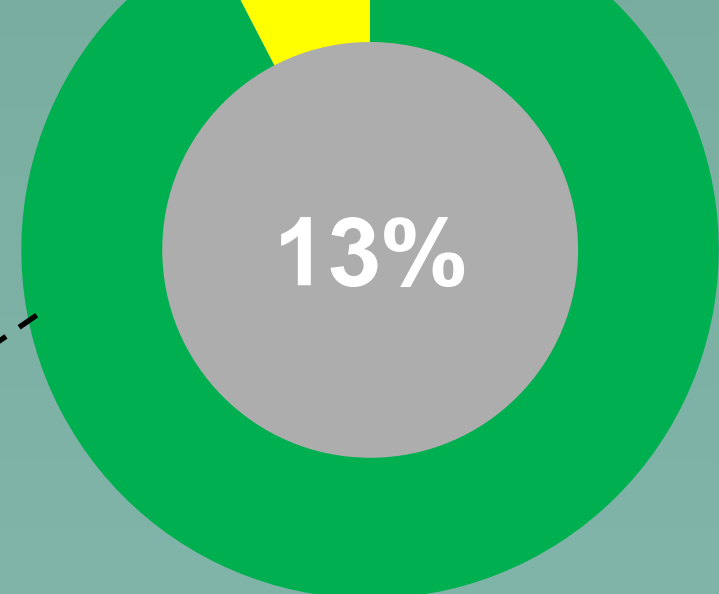
Castel, 1991

Engbertsdijkveen



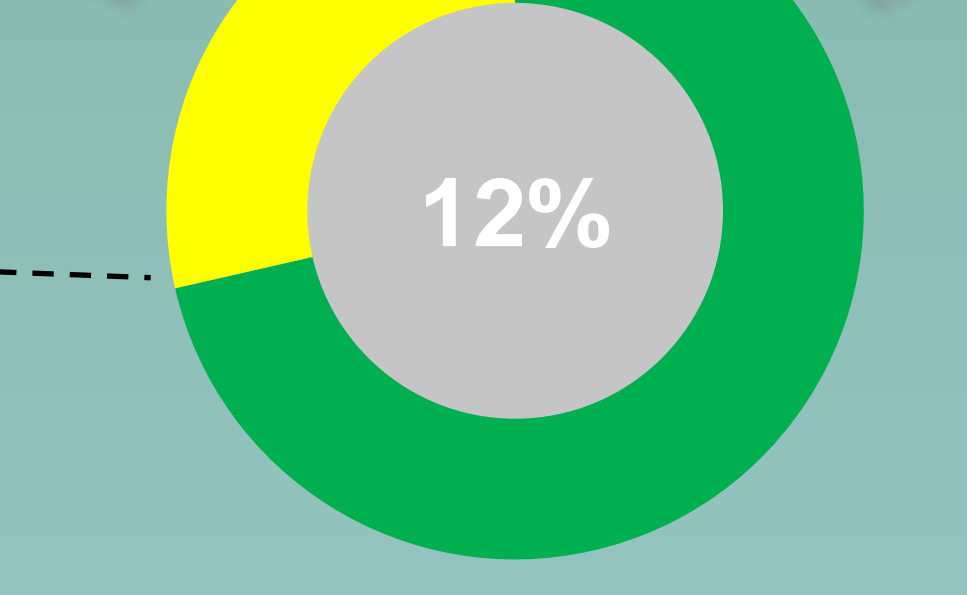
van der Molen & Hoekstra, 1988

De Borchert



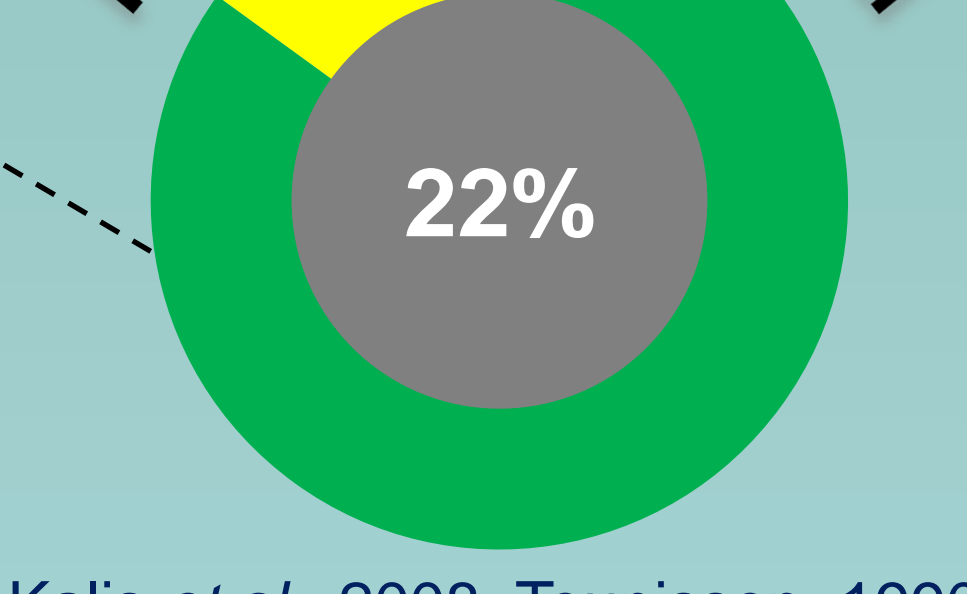
van Geel *et al.*, 1982

Wijk bij Duurstede



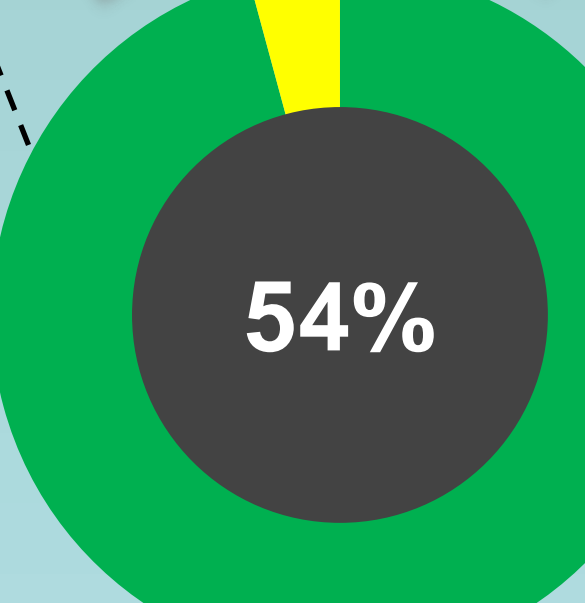
Teunissen, 1990

Horssen Laagveld



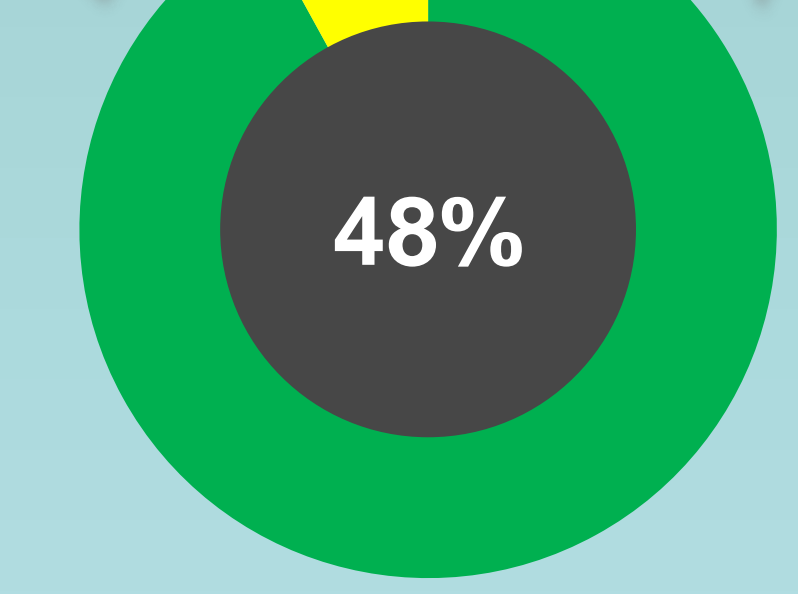
Kalis *et al.*, 2008; Teunissen, 1990

Berkenhof



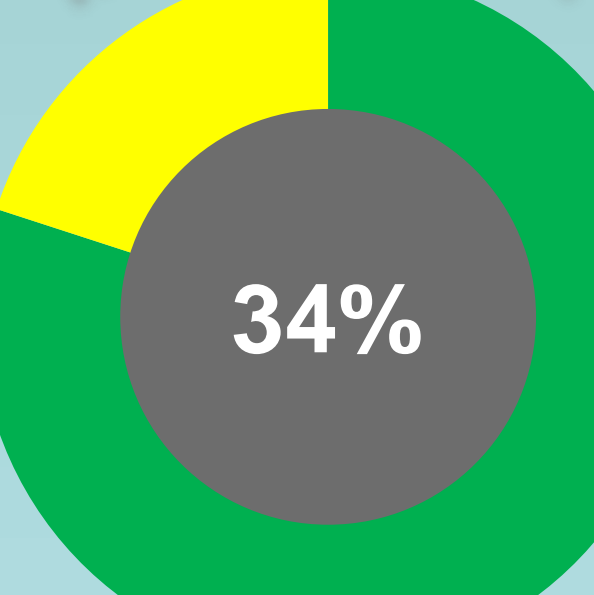
Teunissen, 1990

Kleefsche Beek



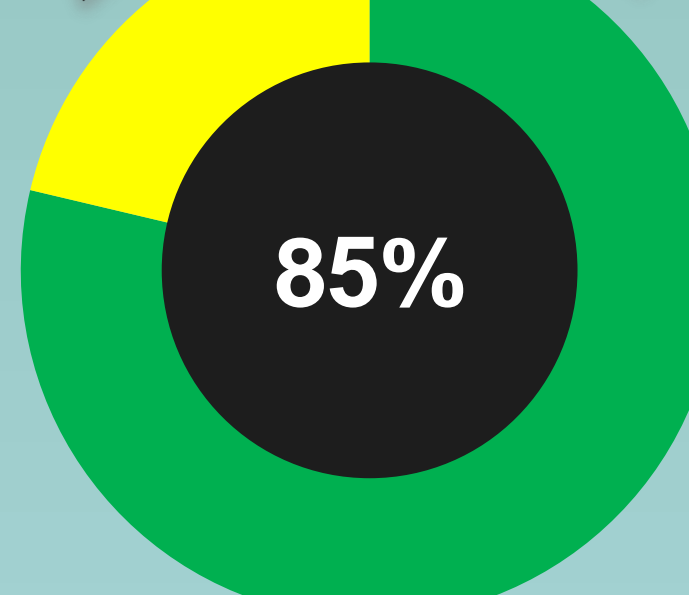
Kalis *et al.*, 2008; Teunissen, 1990

Moerkuilen



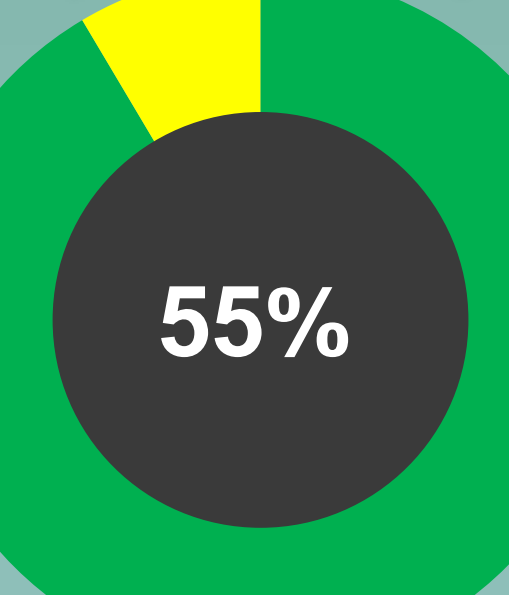
Janssen, 1972

Zeist 't Rond



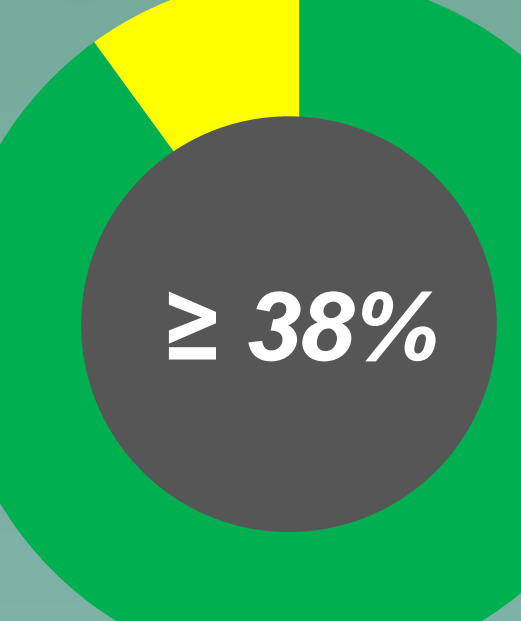
This study, cooperation J.A.A. Bos

Ilperveld

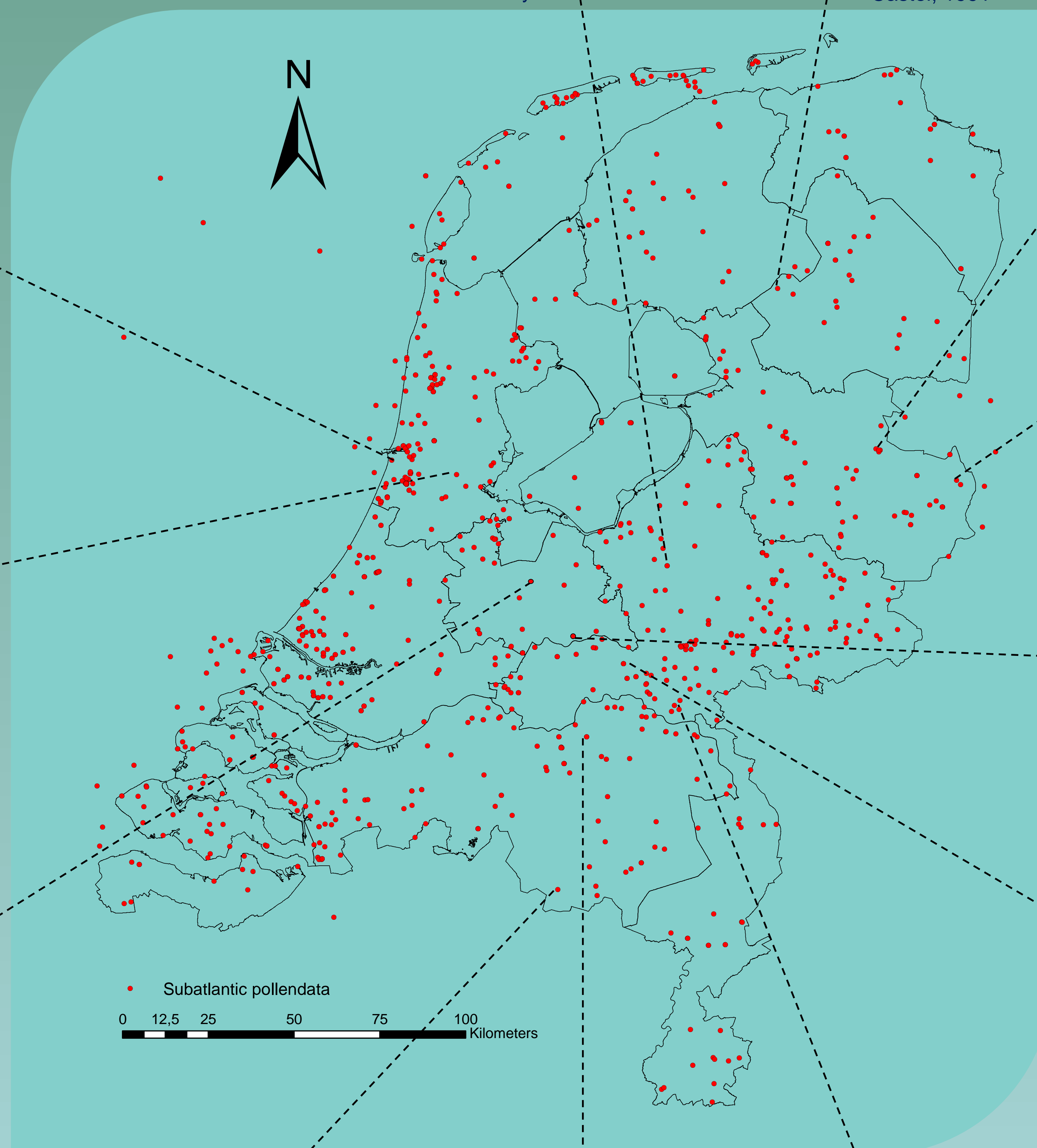


Bakker & van Smeerdijk, 1982

IJmuiden



TNO/RGD data



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