



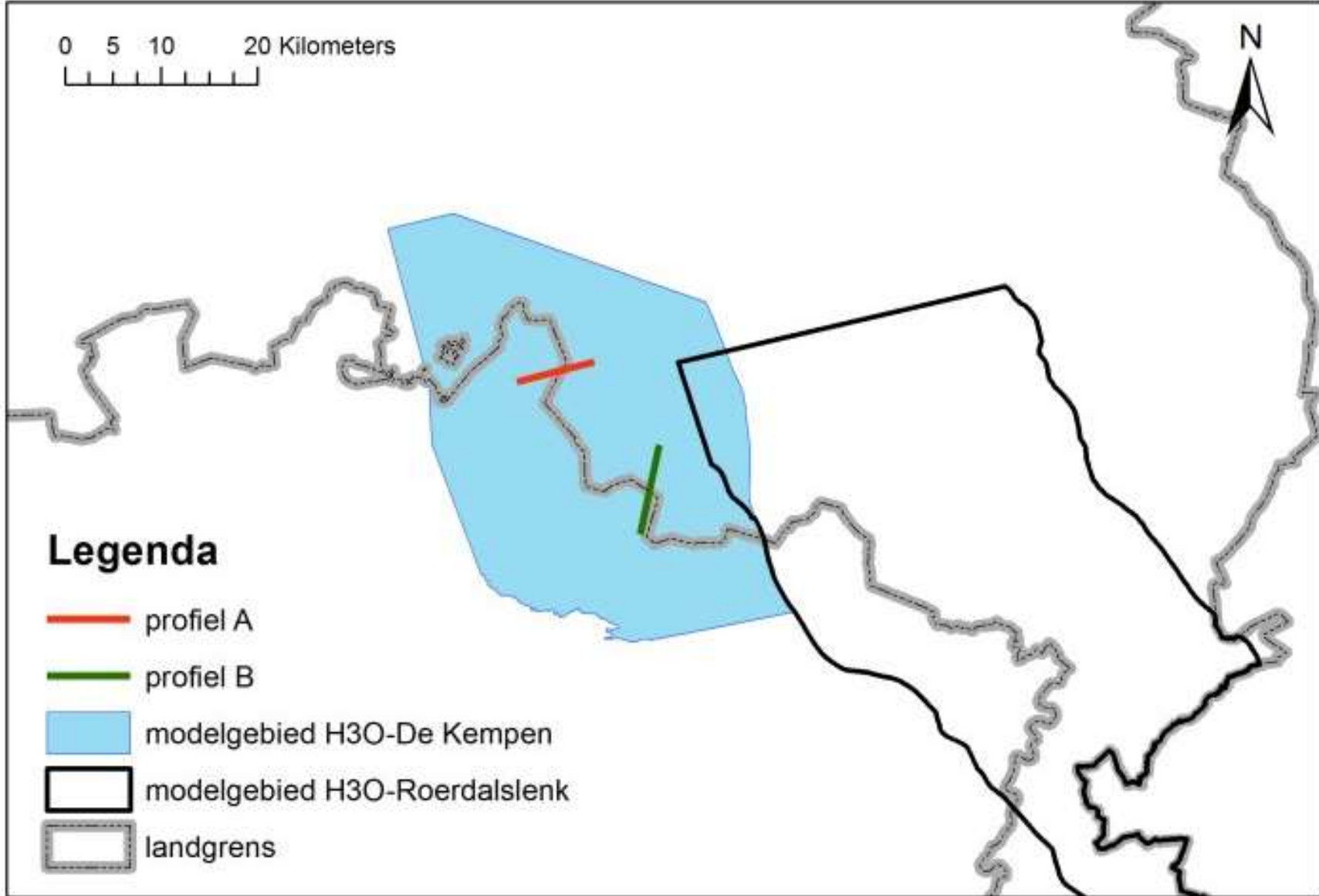
# **Geologische verkenning van de Kempen**

**Michiel Duser**

**Koninklijk Belgisch Instituut voor Natuurwetenschappen**

**Belgische Geologische Dienst**







## **Geologische verkenning van de Kempen**

**De Kempen ?**

**mens en landschap, hun geologische basis**

**geologische problemen en potenties**

**Kempen – Campine = campagne, platteland**

**cf. Champagne, Campania**





## Kempens of Kempisch ?

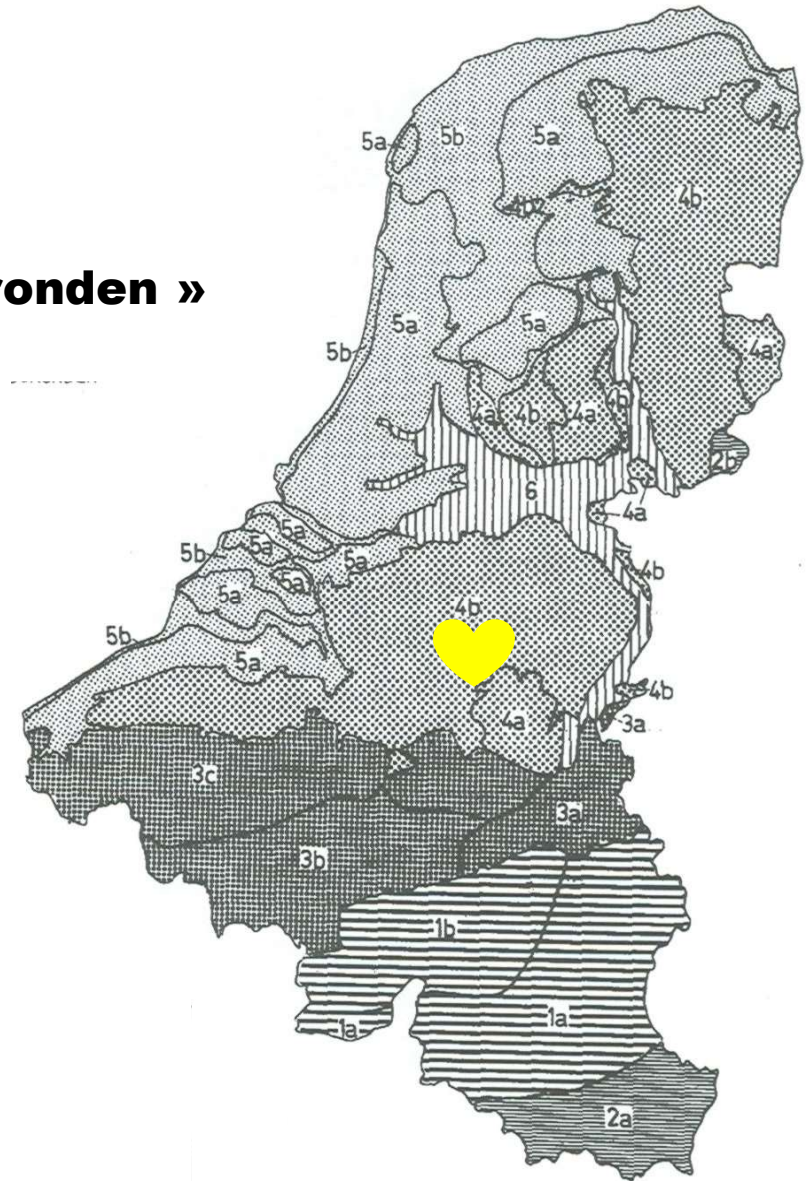


**geografische streken als basis voor**

**landschapontwikkeling :**

**« landschappen van de lage en middelhoge zandgronden »**

**H30 De Kempen**  **van BeNeLux**

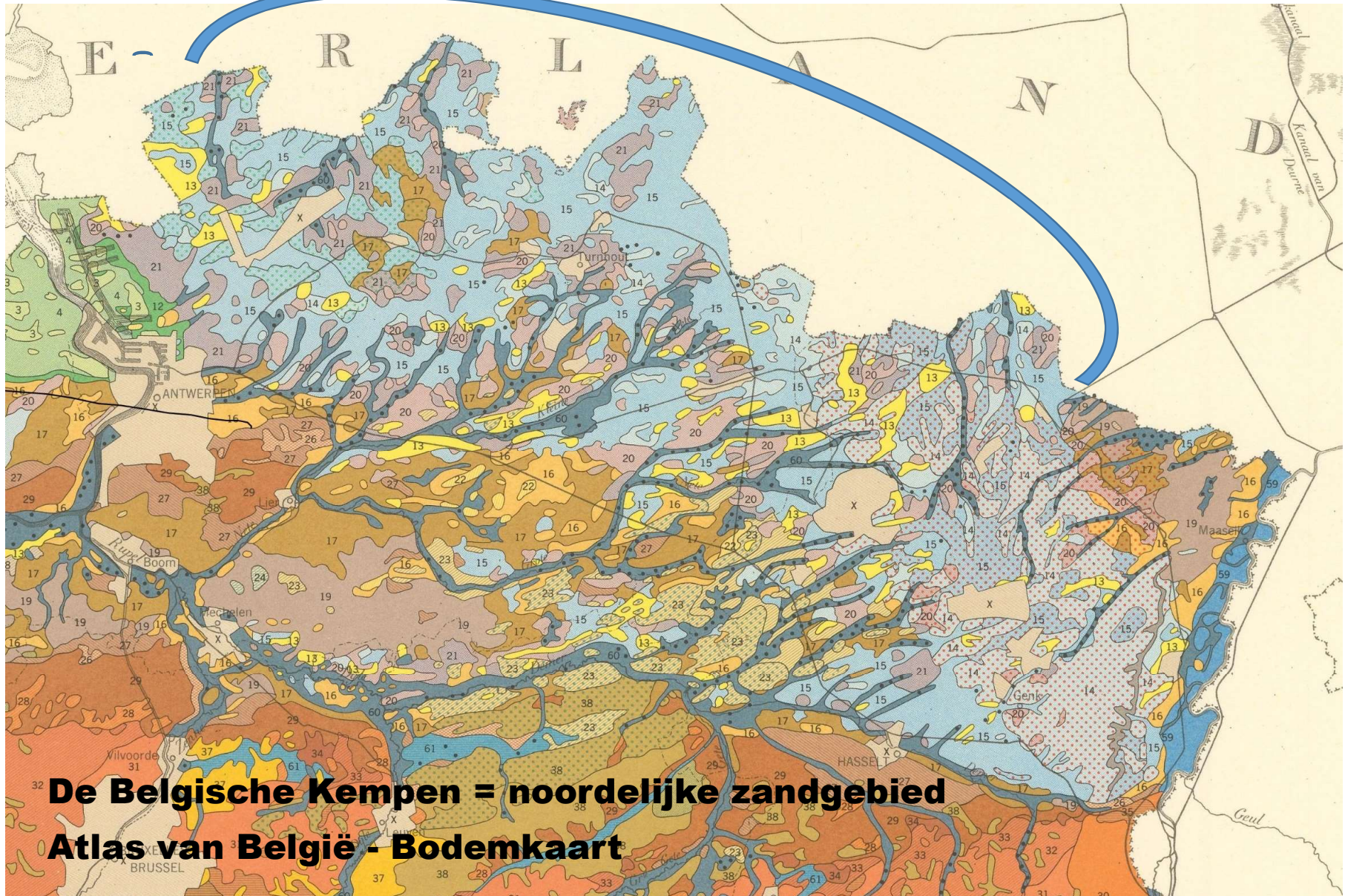




**fysisch-geografische landschapstypes NL**

**H30 De Kempen ⇒ zuidelijk zandgebied**





**De Belgische Kempen = noordelijke zandgebied**

**Atlas van België - Bodemkaart**



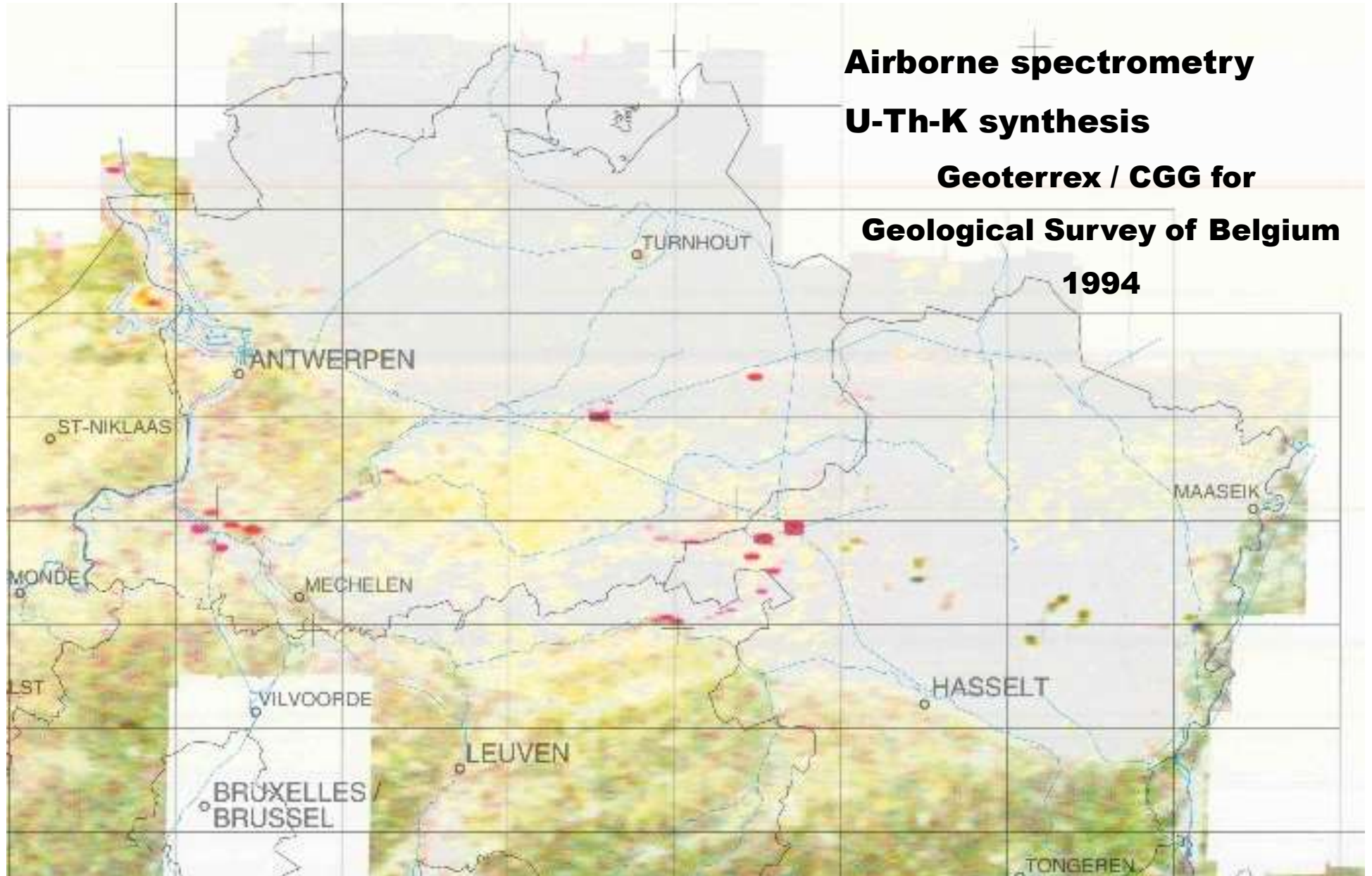
**Airborne spectrometry**

**U-Th-K synthesis**

**Geoterrex / CGG for**

**Geological Survey of Belgium**

**1994**







**Archeologische landschappenkaart Nederland  
van Kempisch zandgebied naar Roerdalslenk**



**“De Kempen is een bosachtig natuurgebied,  
overblijfsel van de uitgestrekte heidevelden in het grensgebied”**

**Welkom bij  
Staatsbosbeheer  
Beheerseenheid  
De Kempen**



**staatsbosbeheer**

**© Wikipedia: De Kempen (natuurgebied)**





**Cartierheide (natuurgebied De Kempen)  
op Kempische Dekzandrug**

**© Wikipedia: De Kempen (natuurgebied)**



**“De Kempen is een aardrijkskundige, meer bepaald diluviale zandstreek in het noordoosten van België en het zuidoosten van de Nederlandse provincie Noord-Brabant, ten zuiden van de lijn Eindhoven-Tilburg”**

*[Wikipedia](#)*





**Kampina natuurreservaat, gemeente Boxtel**

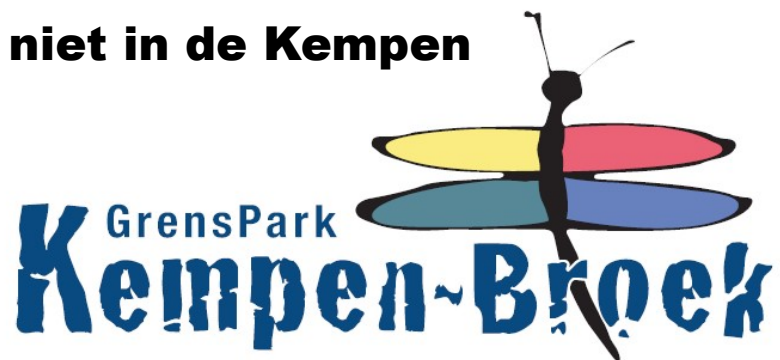




**Kampina natuurreserveaat, gemeente Boxtel**



ook niet in de Kempen







**'t Zand, Alphen-Chaam**

## Campinastrand Dessel







**Heidevelden omgezet in cultuurgrond, Ravels (BE)**





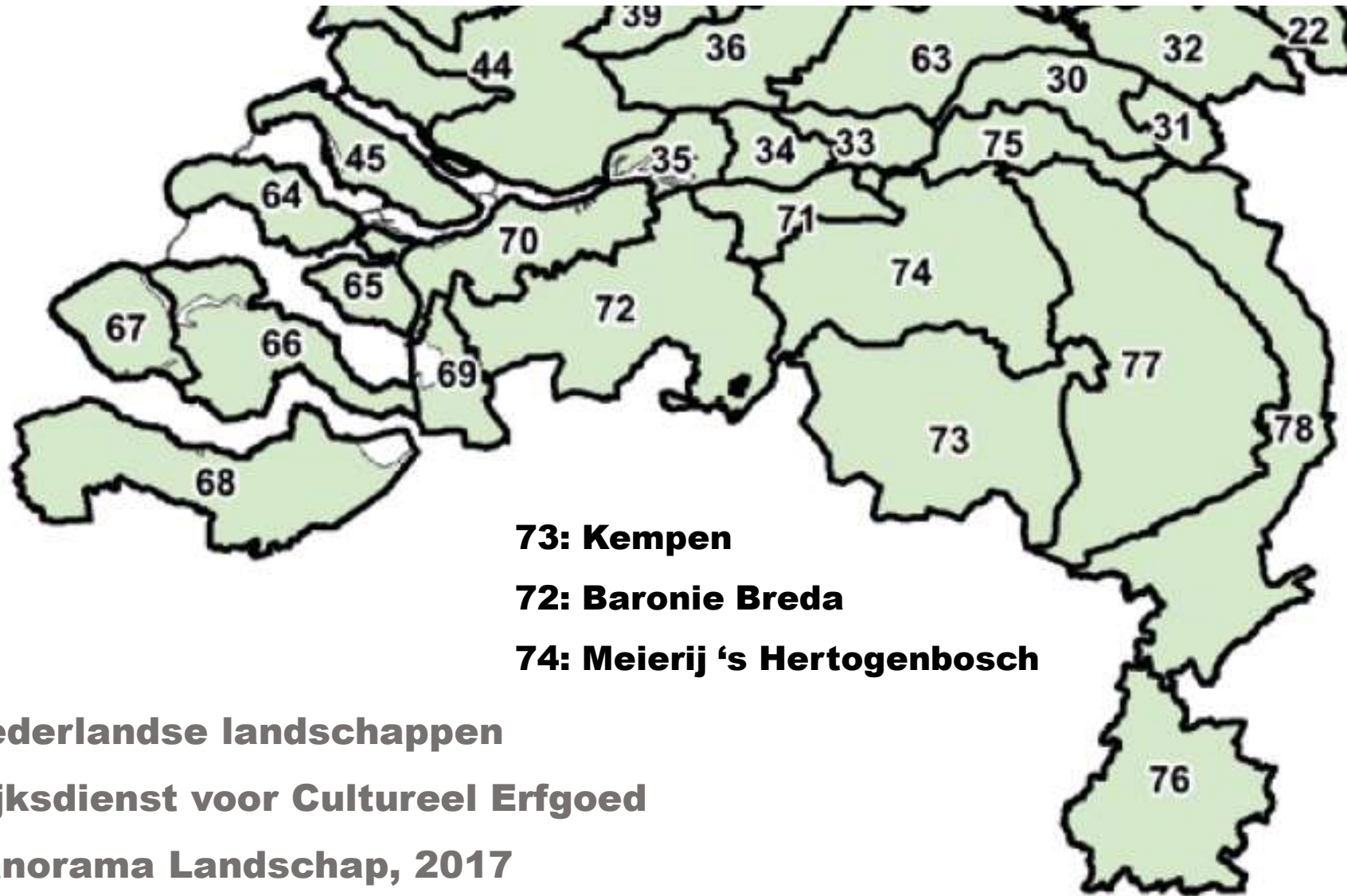
**Heidevelden omgezet in cultuurgrond, Alphen (NL)**





Jan and Gijs van der Borne play on mountains of potatoes grown on their family's ultra-productive farm, which yields twice the global average. The reason? Drones and other tools assess the health of individual plants and determine exactly how much water and nutrients they need to thrive.

**Aardappelen uit H30 grensgebied in National Geographic Magazine**



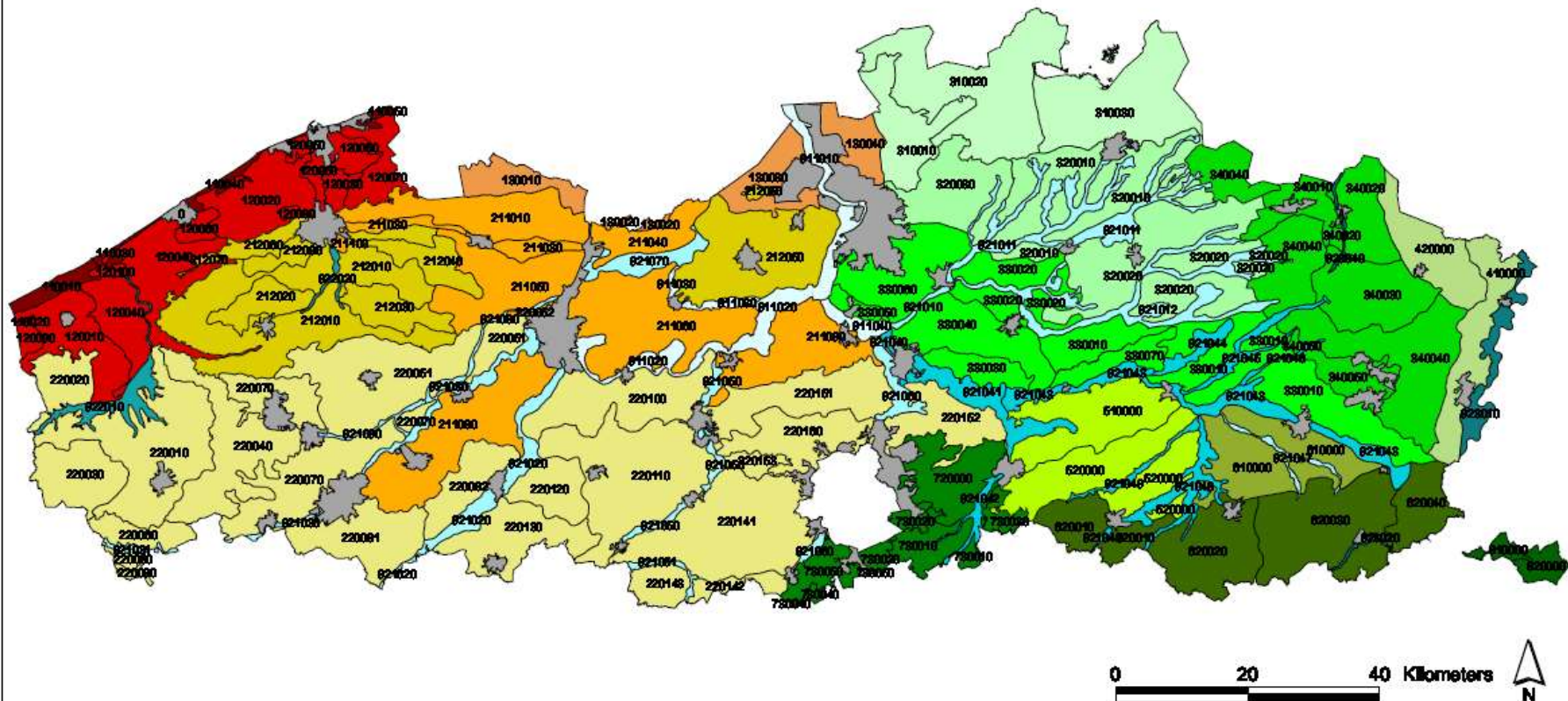
**Nederlandse landschappen**

**Rijksdienst voor Cultureel Erfgoed**

**Panorama Landschap, 2017**



# Traditionele landschappen van het Vlaamse Gewest



## Legende

|  |                                      |  |                                   |  |                               |  |                            |
|--|--------------------------------------|--|-----------------------------------|--|-------------------------------|--|----------------------------|
|  | Stedelijke gebieden en havengebieden |  | Zandtrek buiten de Visamse Vallei |  | Hageland                      |  | Netebekken                 |
|  | Kuif                                 |  | Zandleem- en leemtrek             |  | Vochtig Haspengouw            |  | Dijle-Gete-Demeris         |
|  | Kuifpolders                          |  | Noorderkempen                     |  | Droog Haspengouw              |  | Kuifbekken met IJzer       |
|  | Scheldepolders                       |  | Zuiderkempen                      |  | Brabantse Leemtrek            |  | Maaebekken                 |
|  | Zandtrek binnen de Visamse Vallei    |  | Kempens Plateau                   |  | Land van Herve                |  | Scheldebekken met getijden |
|  |                                      |  | Maailand                          |  | Scheldebekken zonder getijden |  |                            |

  
**UNIVERSITEIT GENT**  
 Vakgroep Geografie  
 Krijgslaan 281 - S8, 9000 Gent  
 Prof. Dr. Marc Antrop  
 Lic. Veerle Van Estvelde  
 Lic. Jo Janssens  
 Lic. Ilse Martens  
 Lic. Sylvie Van Damme  
 Versie 6.1 - maart 2002



de Kempen, gevoelsmatig





**Baarle Nassau / Hertog**





**Alphen**

## **Kempische baksteengotiek**



**Weelde**





**Kempische langgevelhoeve**



**Kempens schaap**

having been bred in the Low Countries for centuries. One authority says: \* 'They exactly answer to the *G. turcica*, or Turkish fowl of Old Androvanus'; whilst another states † that 'by tradition it dates as far back as 1206.' It is probable that fowls of this type were common over a great part of Europe, and, as our poultry came from the East to the West, the suggestion as to the *G. turcica* has much to be said in its favour. Such divergences of type as are met with even in Belgium, where both rose and single combed fowls of Campine character are found, are to be expected in the absence of fixed standards, and where the

Antwerp and Hasselt, in the provinces of Antwerp, and Limburg, a district where activity of habit is essential to any breed, as the amount of natural food available is comparatively small. Under such conditions small size of body would be expected. At one period the Campine was almost universal, but of late years, to meet the demand for table poultry, another and larger race has been introduced—the Malines. Our first personal knowledge of the Campine was in 1885, during a visit to Belgium, but they did not offer any special attraction, appearing very inferior to Hamburgs, and although reputed to be splendid layers,

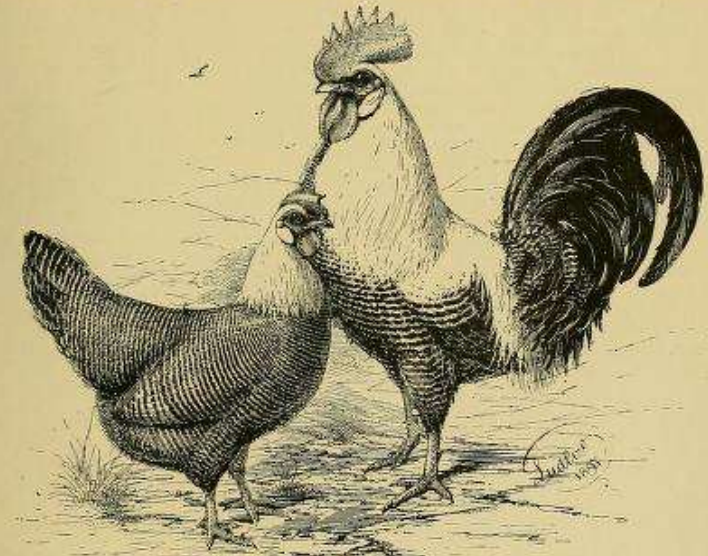


FIG. 42. SILVER CAMPINES.

economic qualities are the primary object. In this instance we have a breed which can claim purity of race for a very long period—one of the few to be met with. Practically, that is all we know of it.

**History.**—The name given to the race is derived from the fact that it is so largely bred in the Campine country—that is, the dry, sandy plain lying between

the eggs were small, very much below the requirements of our markets. In 1897, during a further tour in the Low Countries, we were surprised to find that by careful selection the size of egg had been greatly increased, and that greater attention had been given to purity of type. Our notes published at that time led English breeders to import Campines, and the breed has attained a fair measure of success, but chiefly in the hands of exhibitors. Our interest in the breed is by reason of its prolificacy, and we regret to see that the merely external characters are unduly

\* 'New Book of Poultry,' by Lewis Wright (London, 1902), p. 463.  
 † 'Our Poultry,' by Harrison Weir, F.R.H.S. (London, 1902), p. 588.

**het Kempisch Hoen**





**Rustica Oud Kempisch  
Beerse**



**Kempenaar**

*Michel Hensen  
Binnenvaart in Beeld.com*





**tastbare getuigenissen van de geologische evolutie**

**Residueel Maasgrind**

**De Liereman natuureservaat, Oud-Turnhout**





**Maas – zwerfstenen  
abdij Postel**





ijzeroer

Alphen





**Wit zand van Mol, in Lommel**

**© Wapke Feenstra**



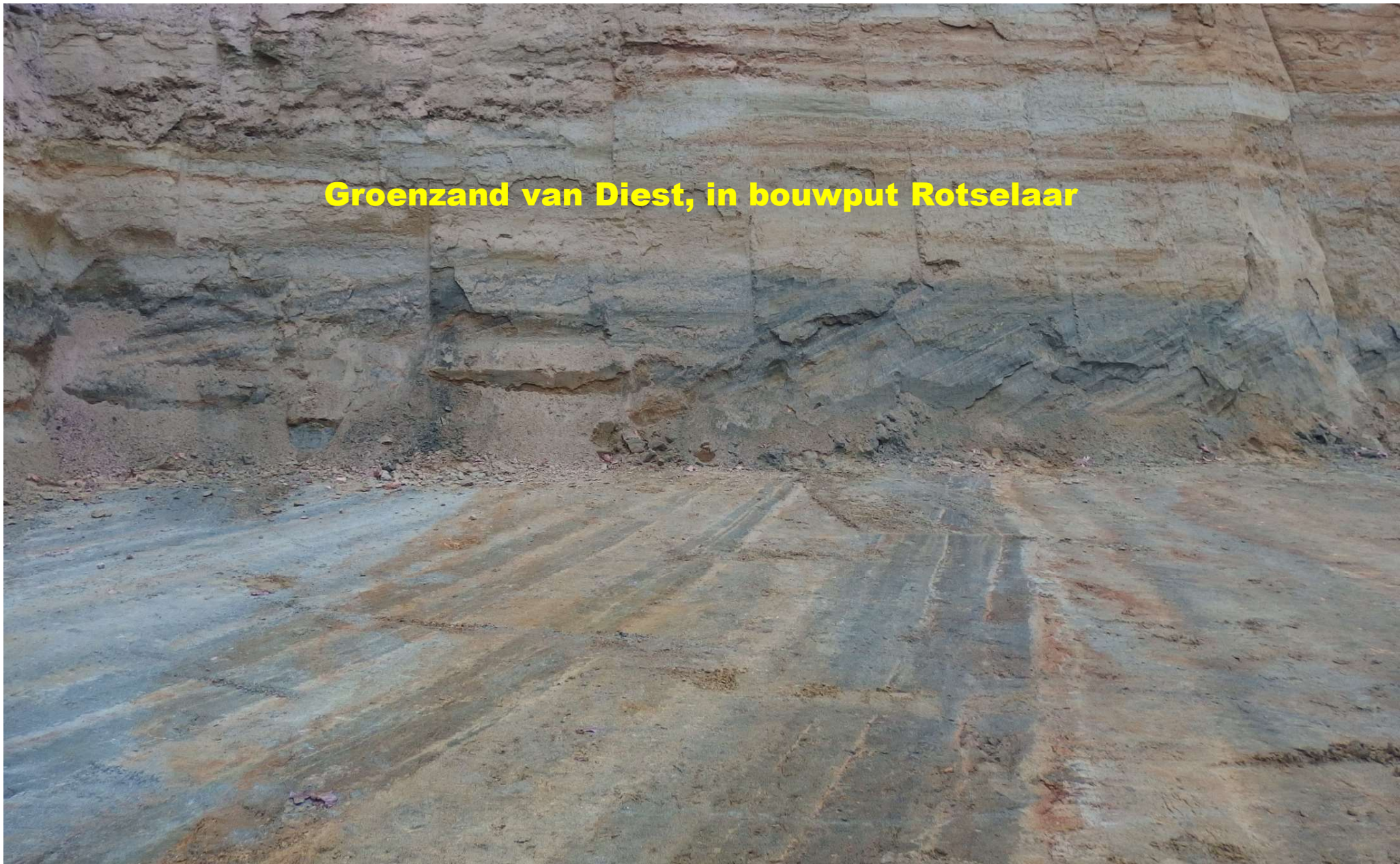


**Witzand van Mol, ontginning in Lommel**

**© Wapke Feenstra**



**Groenzand van Diest, in bouwput Rotselaar**



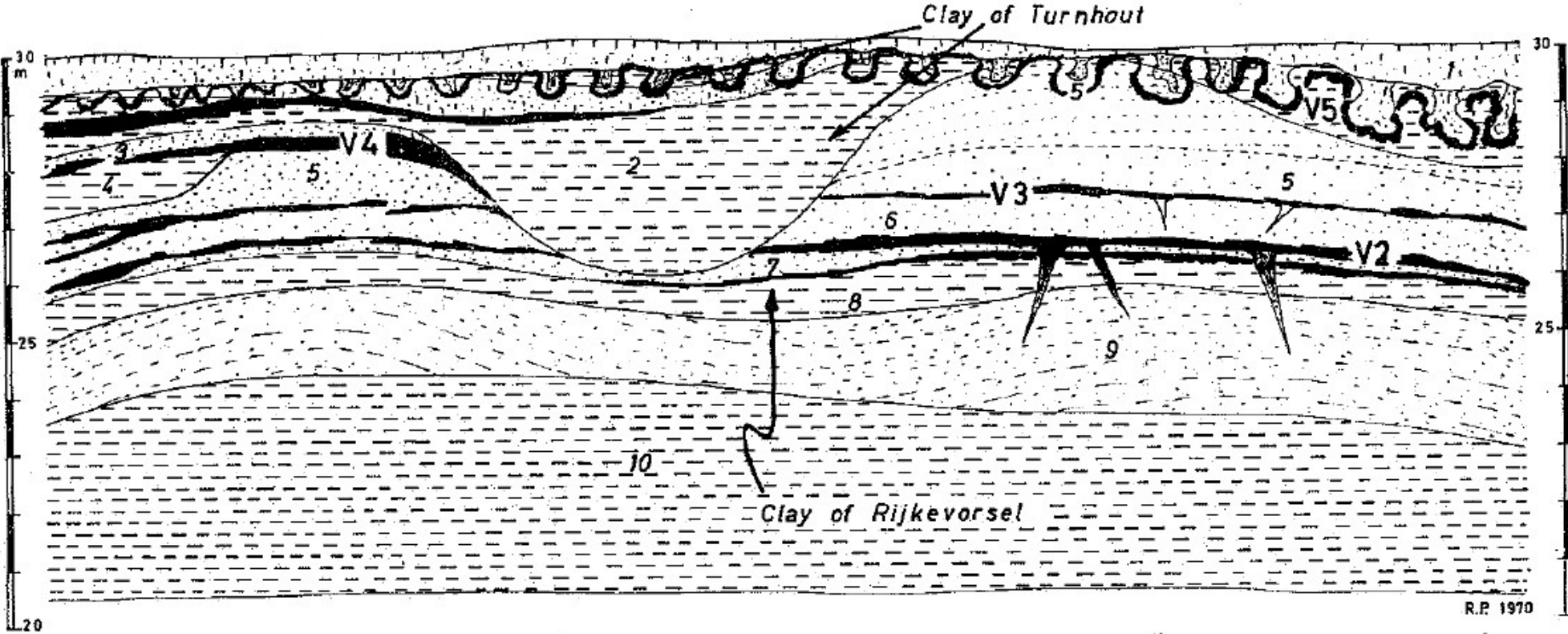


## Klei van de Kempen (Waalre Fm) kleiput Boensberg-Oost (Merksplas-Beerse)





# Kleiput De Toekomst, Beerse



Roland Paepe, 1970

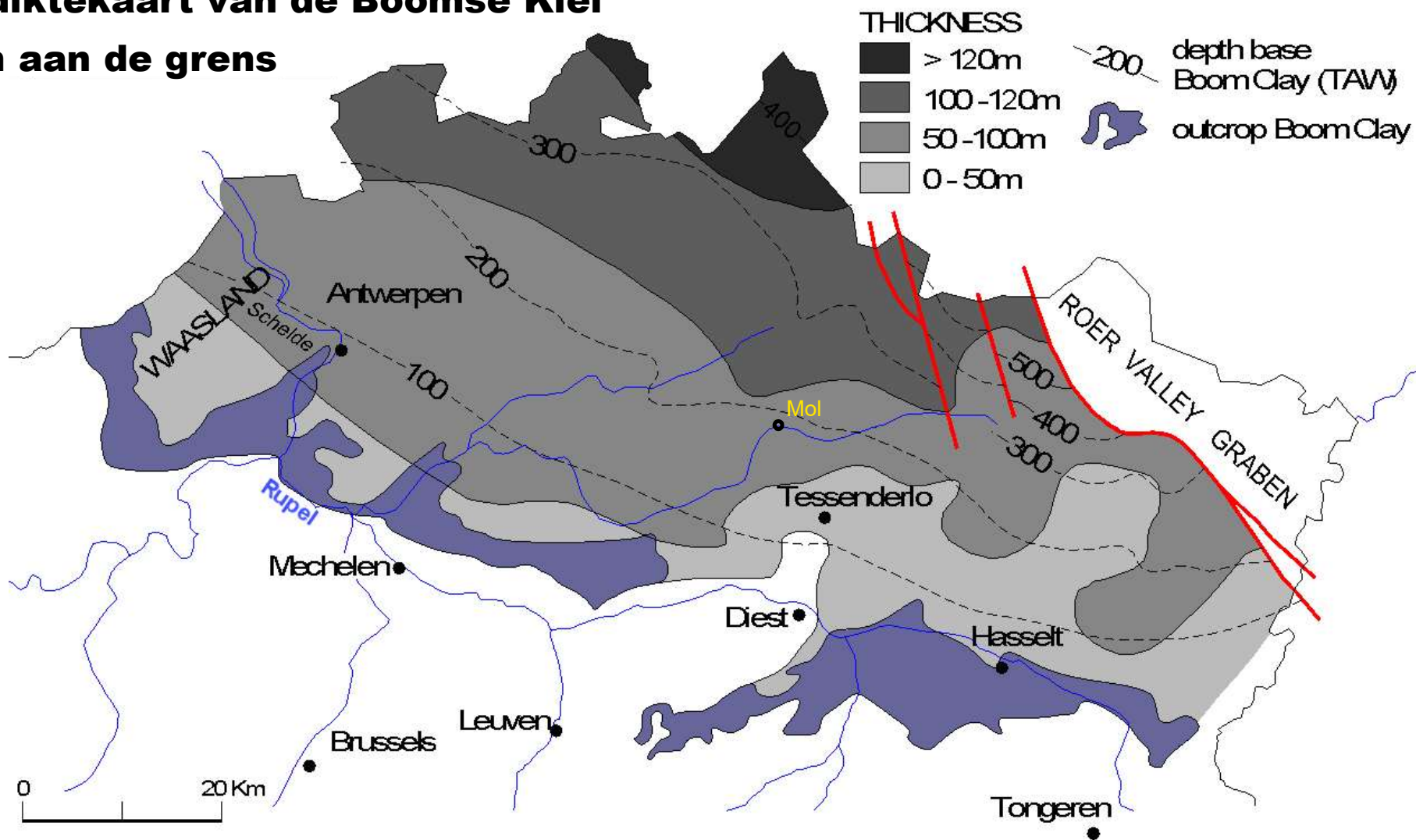


**Boomse Klei in kleiput Terhagen**

**© P. Laga**



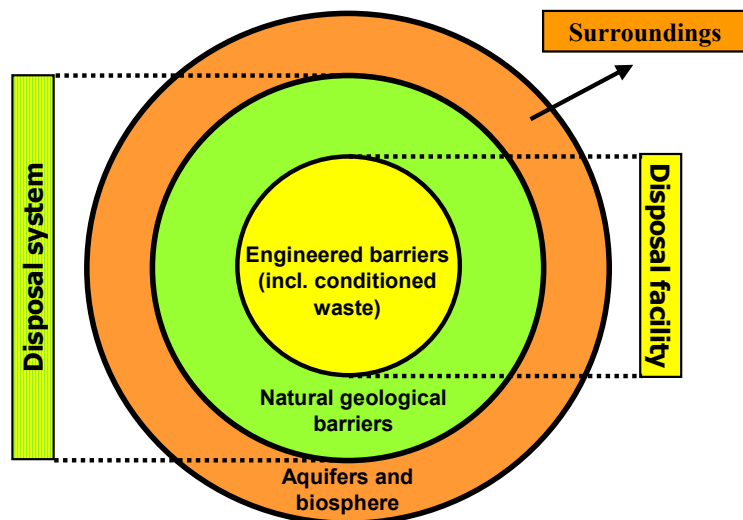
# diepte- en diktekaart van de Boomse Klei afgesneden aan de grens





**Studiecentrum voor Kernenergie, Mol  
BR2 reactor**

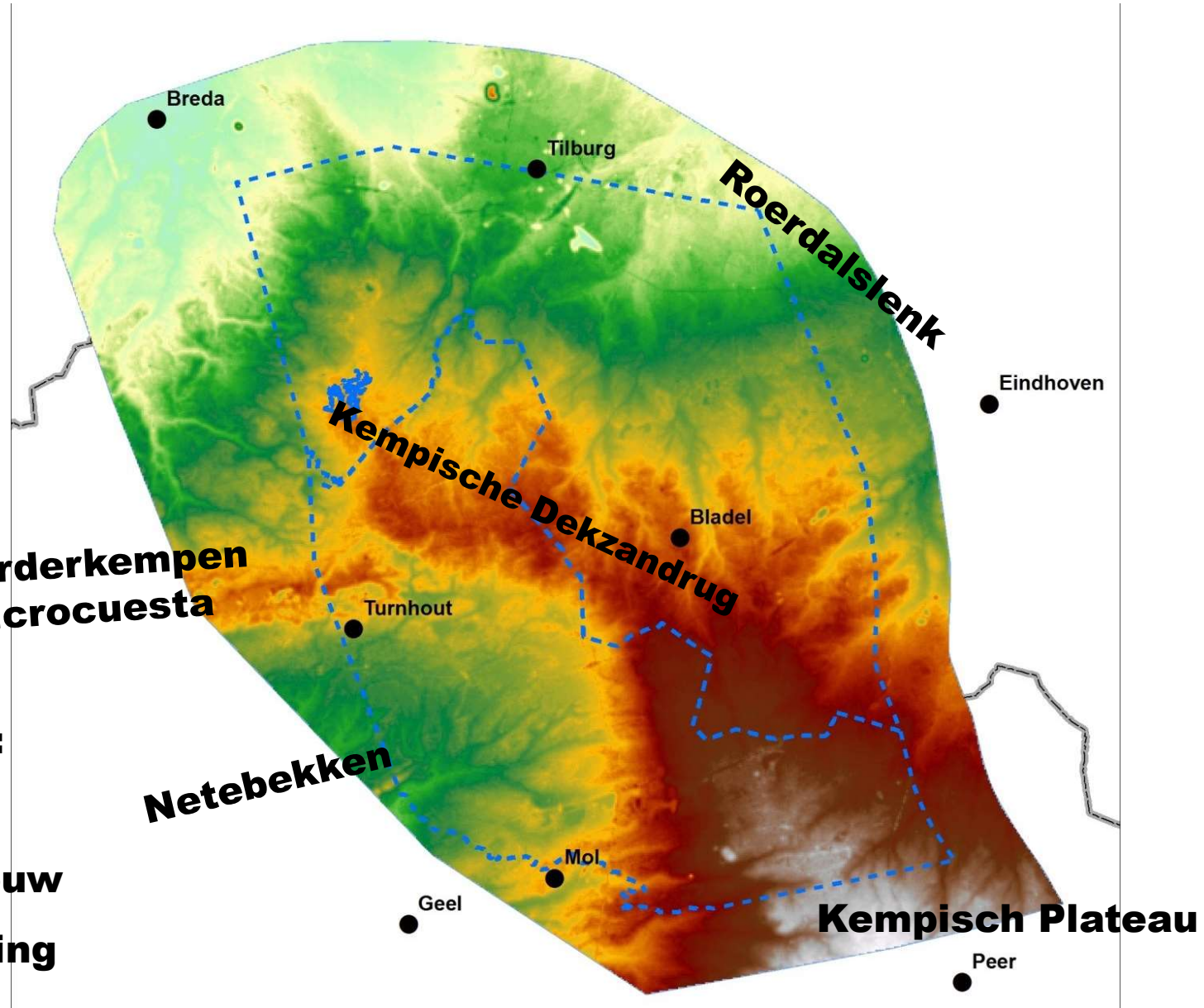




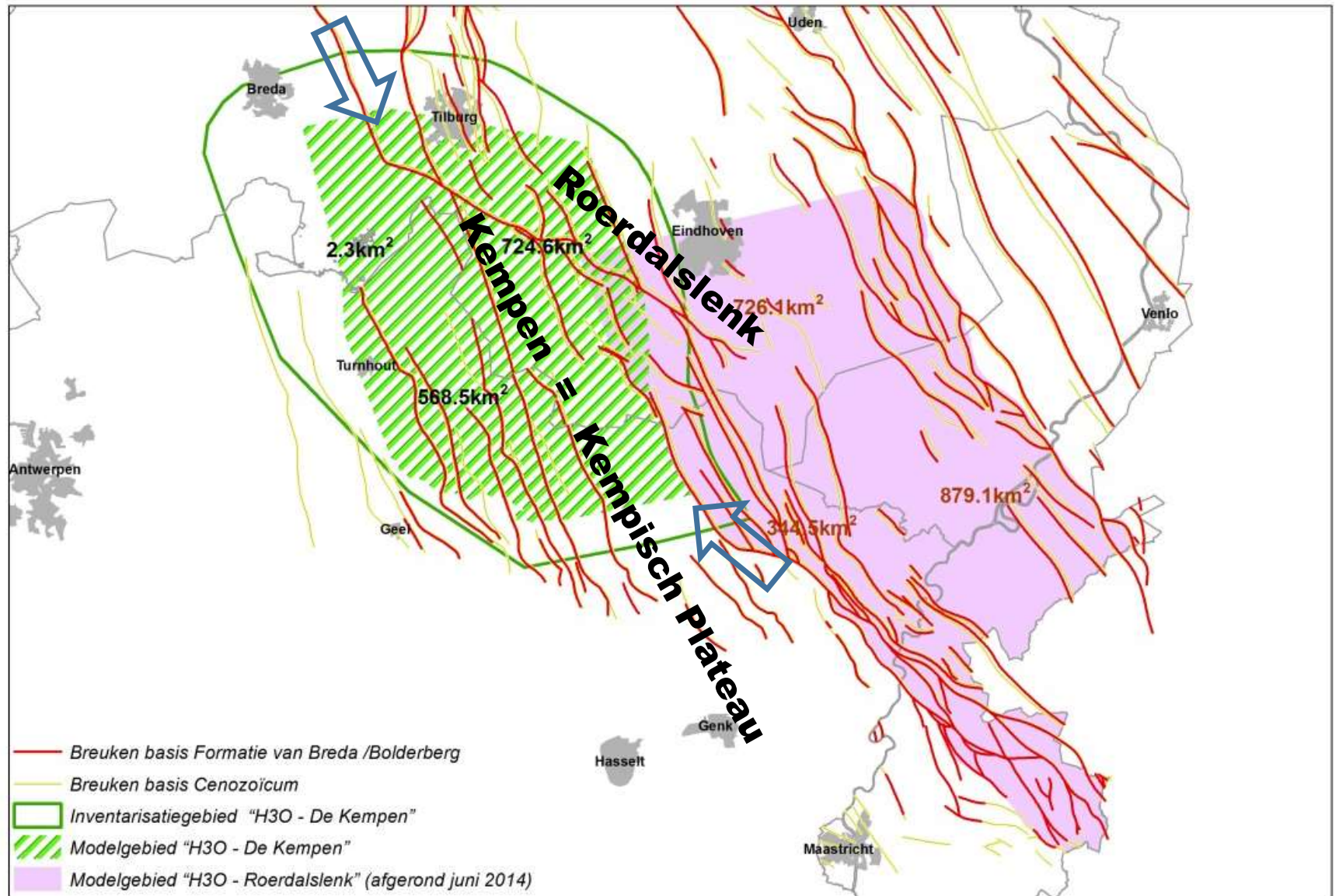
**kleilagen als opslagmedium  
voor radio-actieve afval  
Mol**

© NIRAS

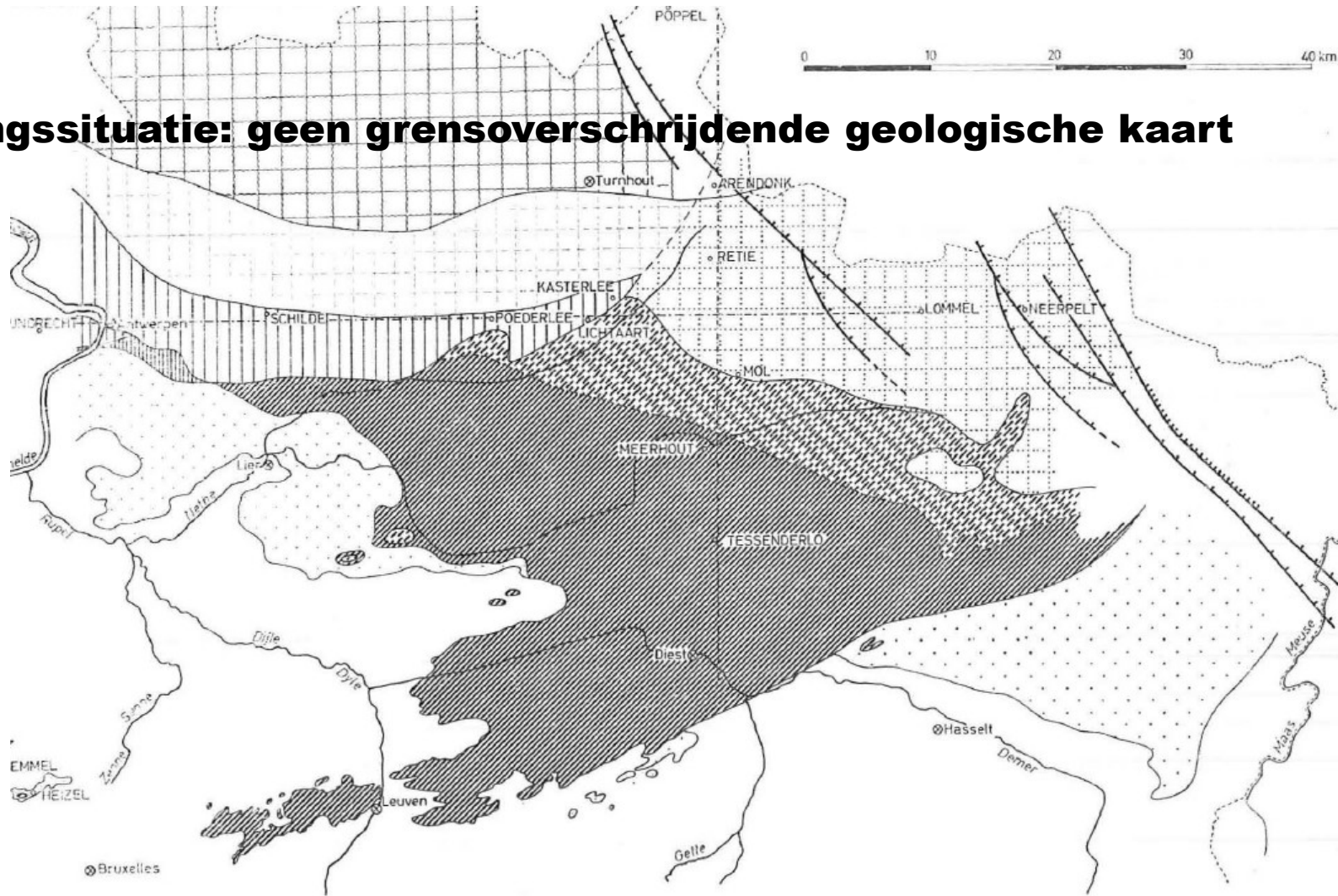
**De Kempen topografisch:  
onvermoede diversiteit  
complexe geologische opbouw  
3D model was zware bevalling**





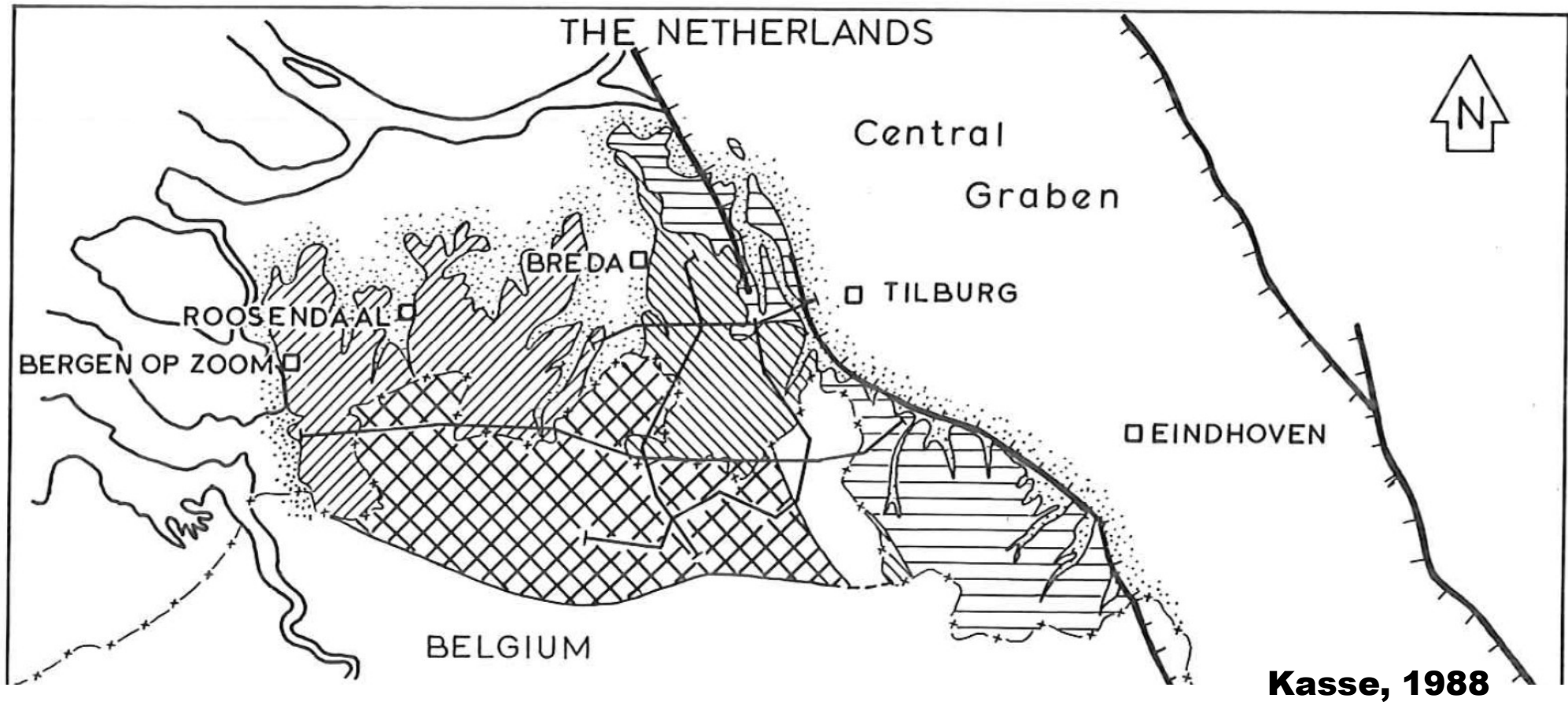


# aanvangssituatie: geen grensoverschrijdende geologische kaart

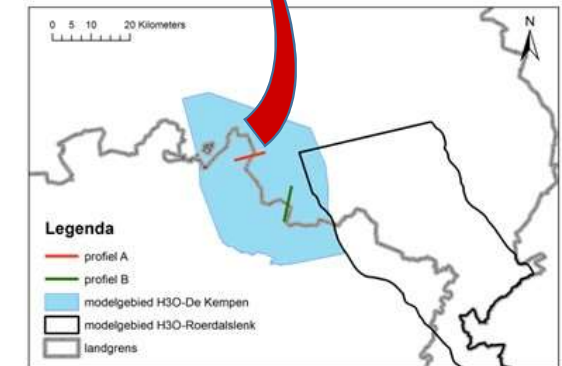
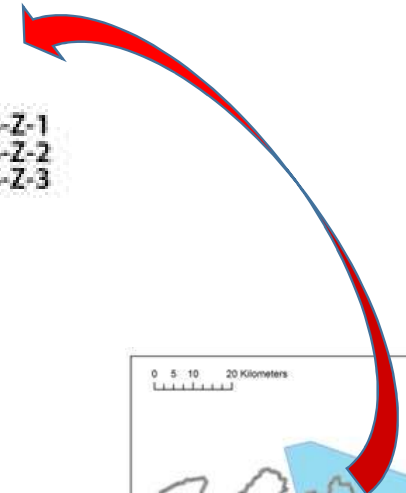
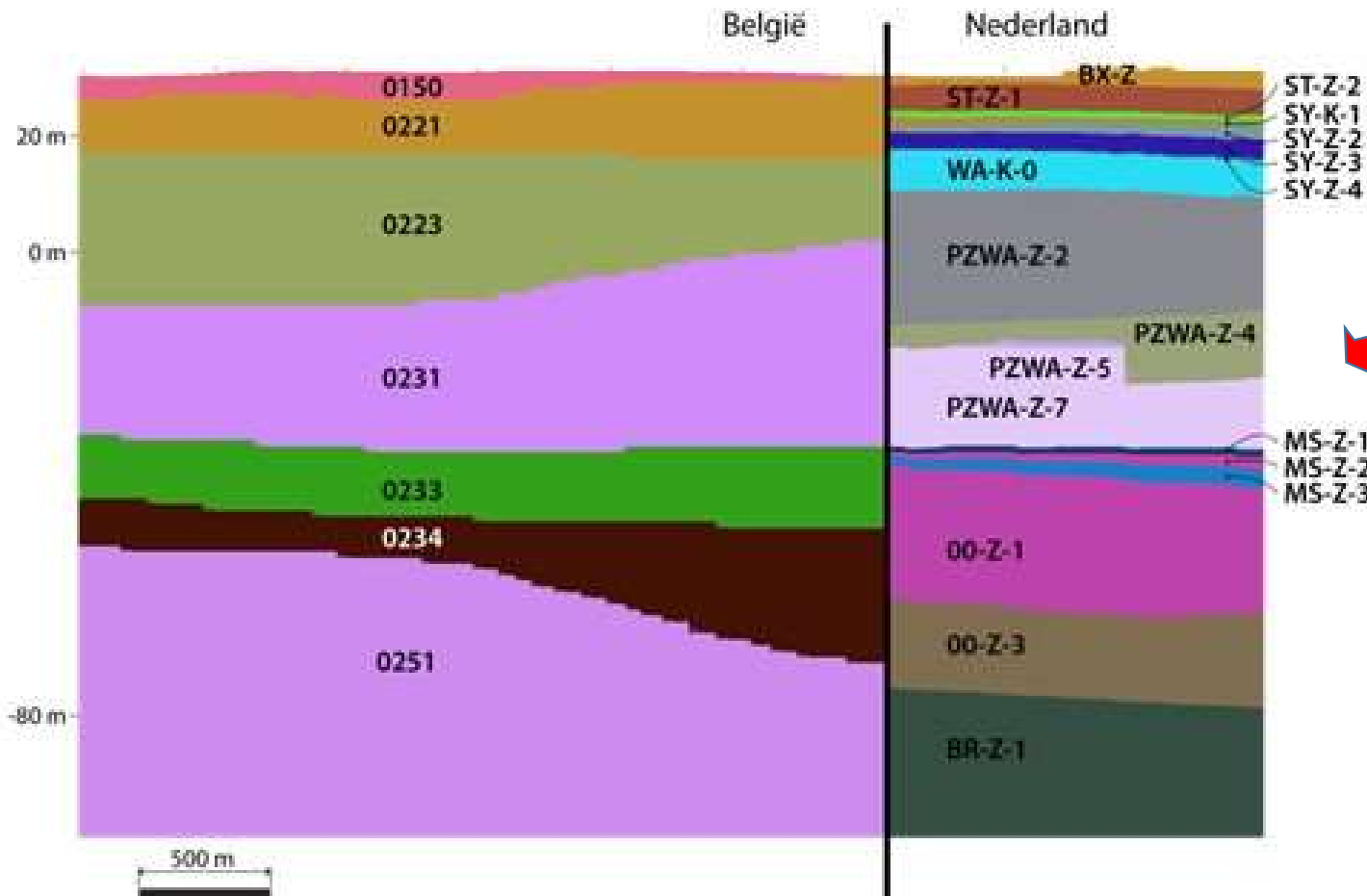


**Gulinck, 1962**



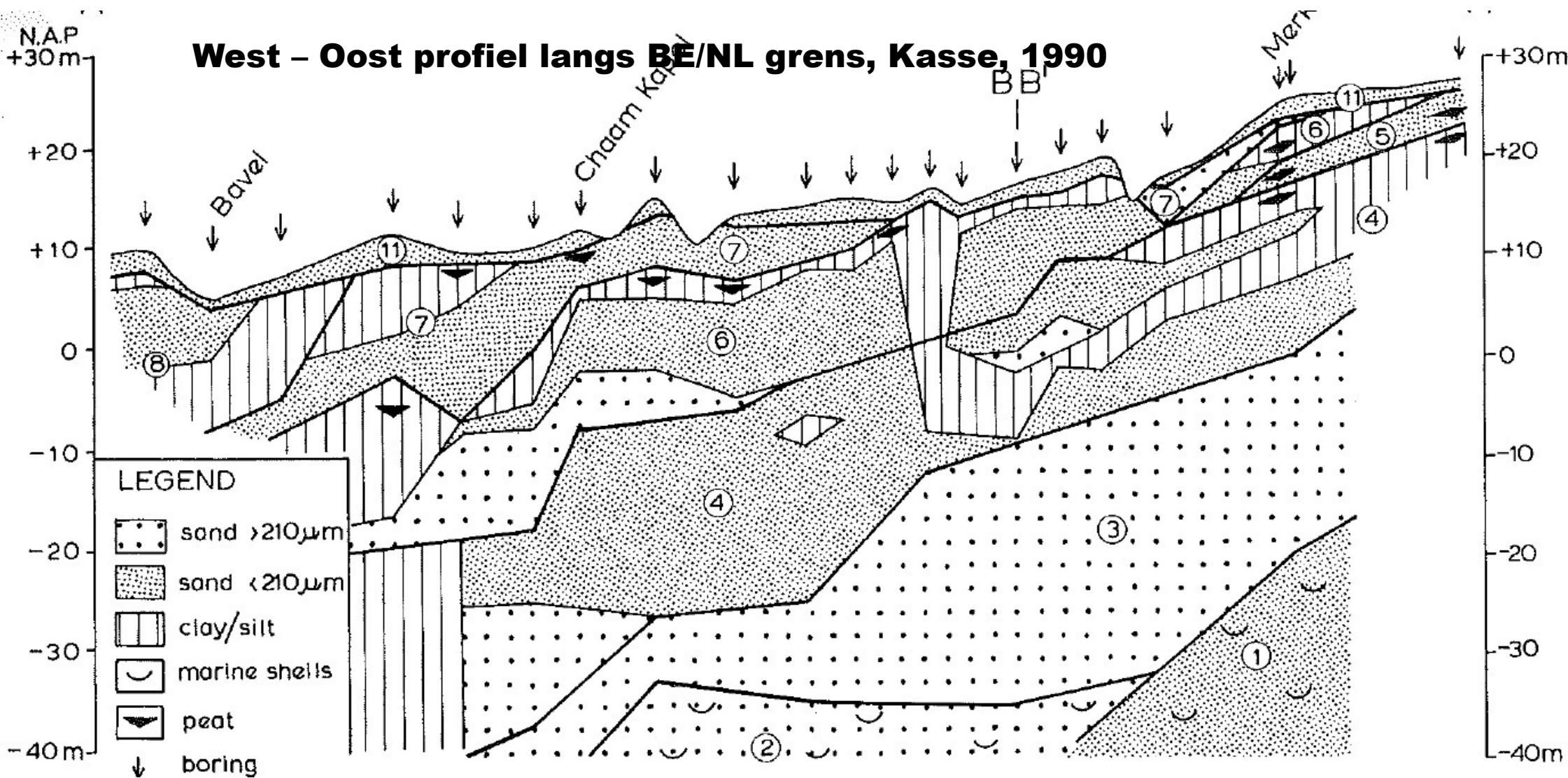


**aanvangssituatie: grensoverschrijdende gesteentelagen**

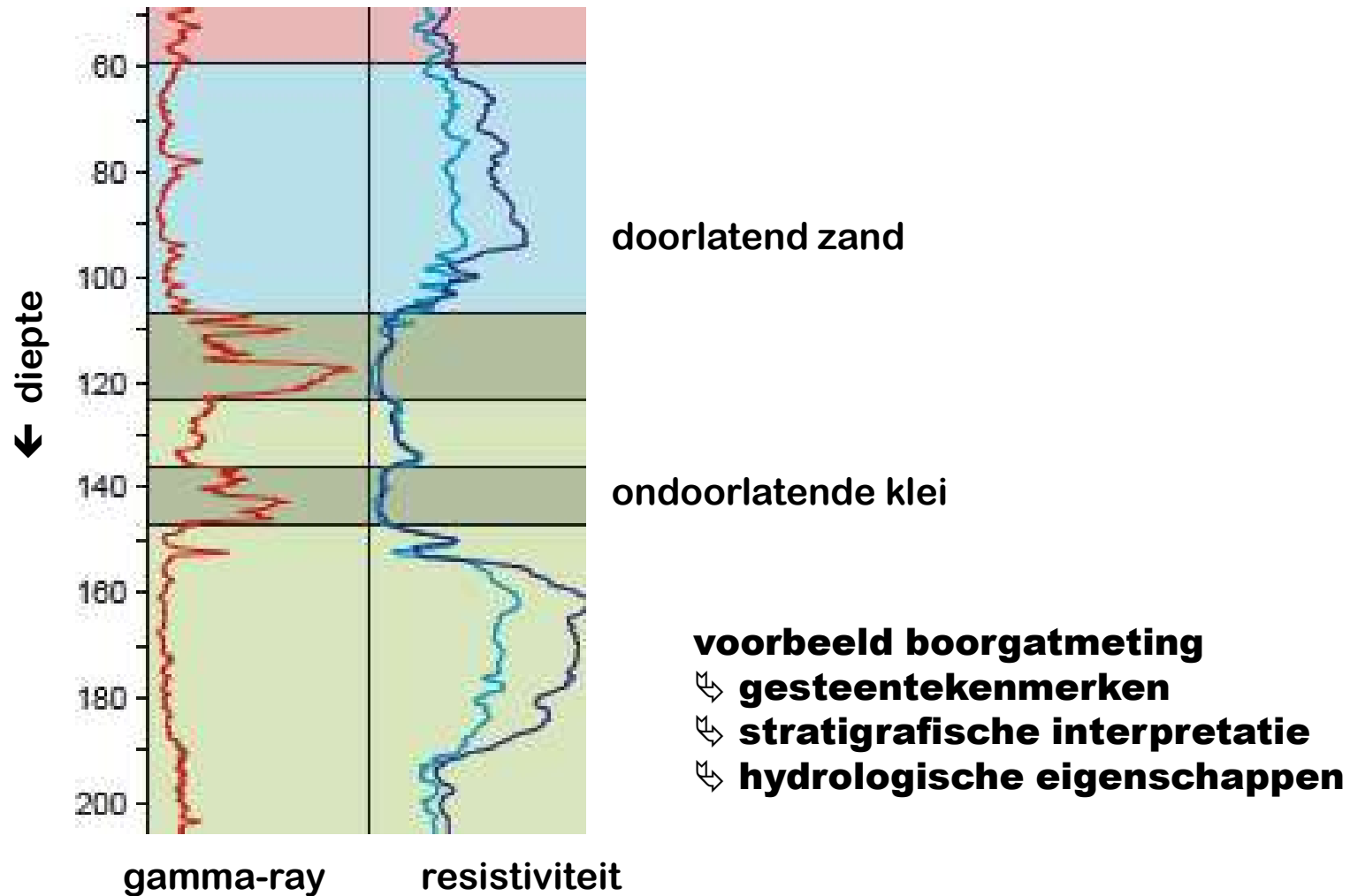


**aanvangssituatie: een harde geologische grens**



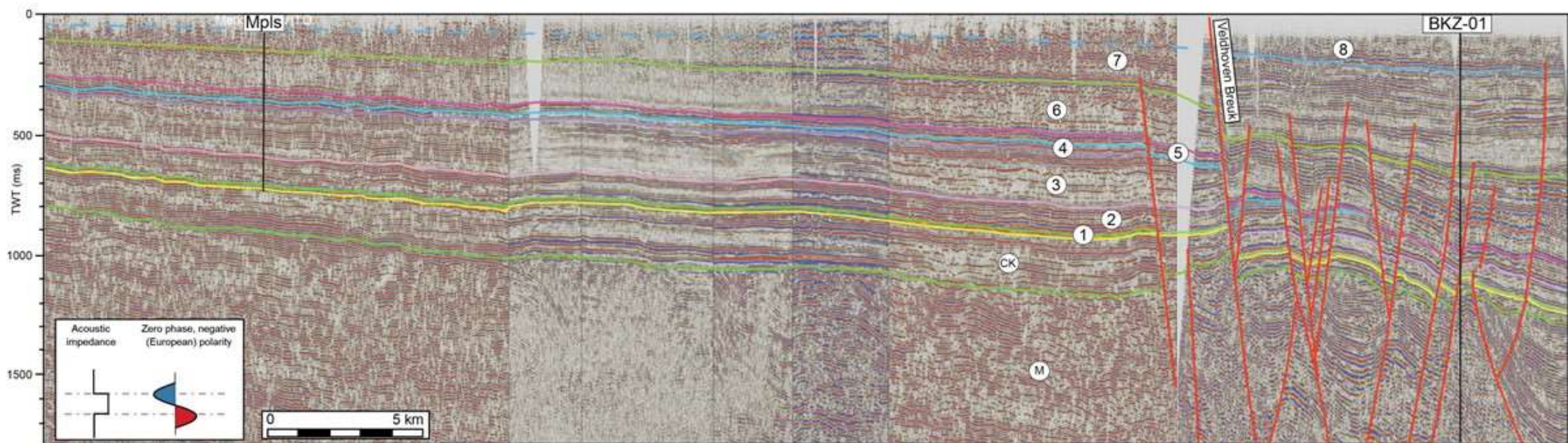


**aanvangssituatie: van complexiteit op het terrein naar stratigrafisch model**

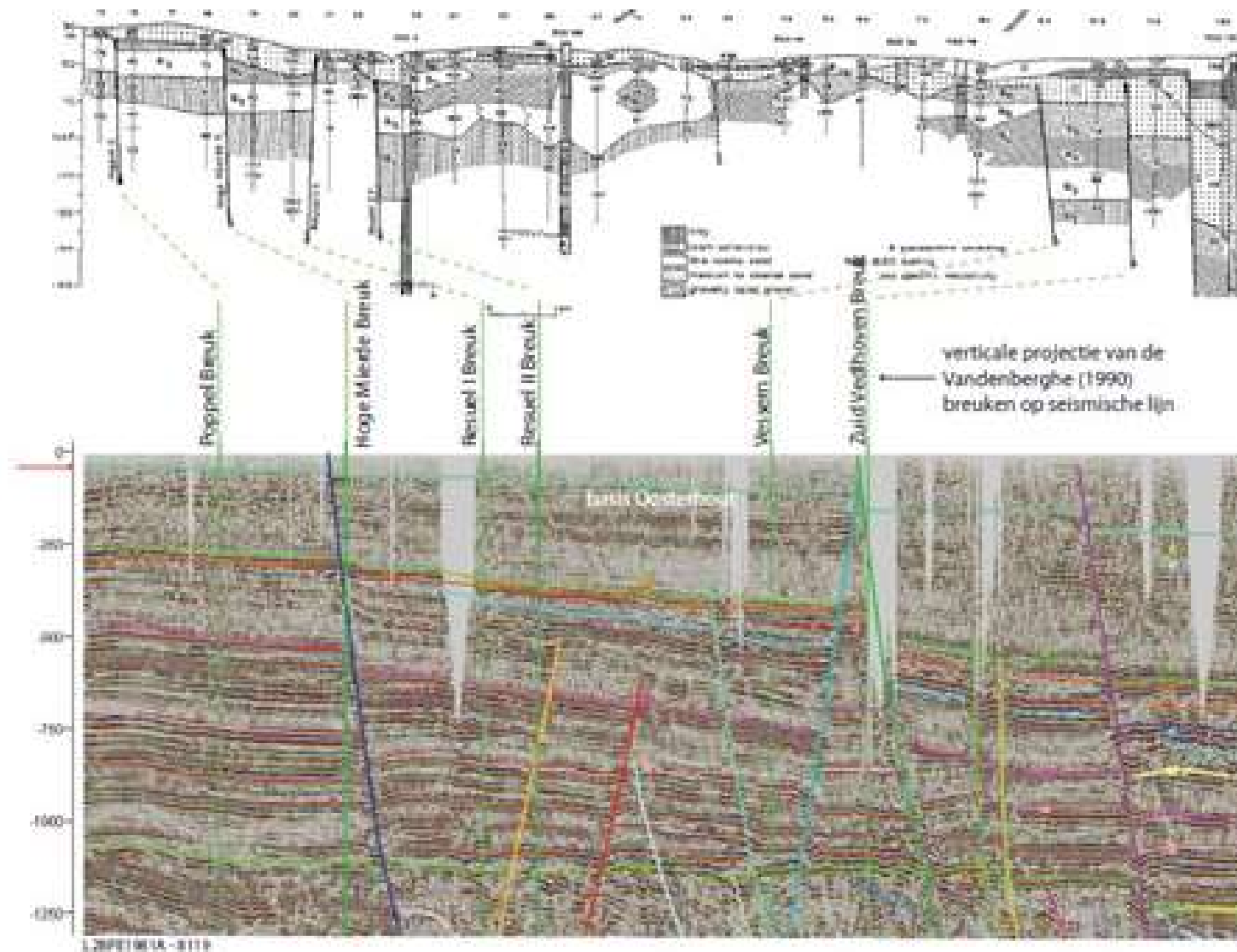


**ondiepe geologische kartering vooral op basis van boorgatmetingen**





**Diepe geologische kartering op basis van seismiek**

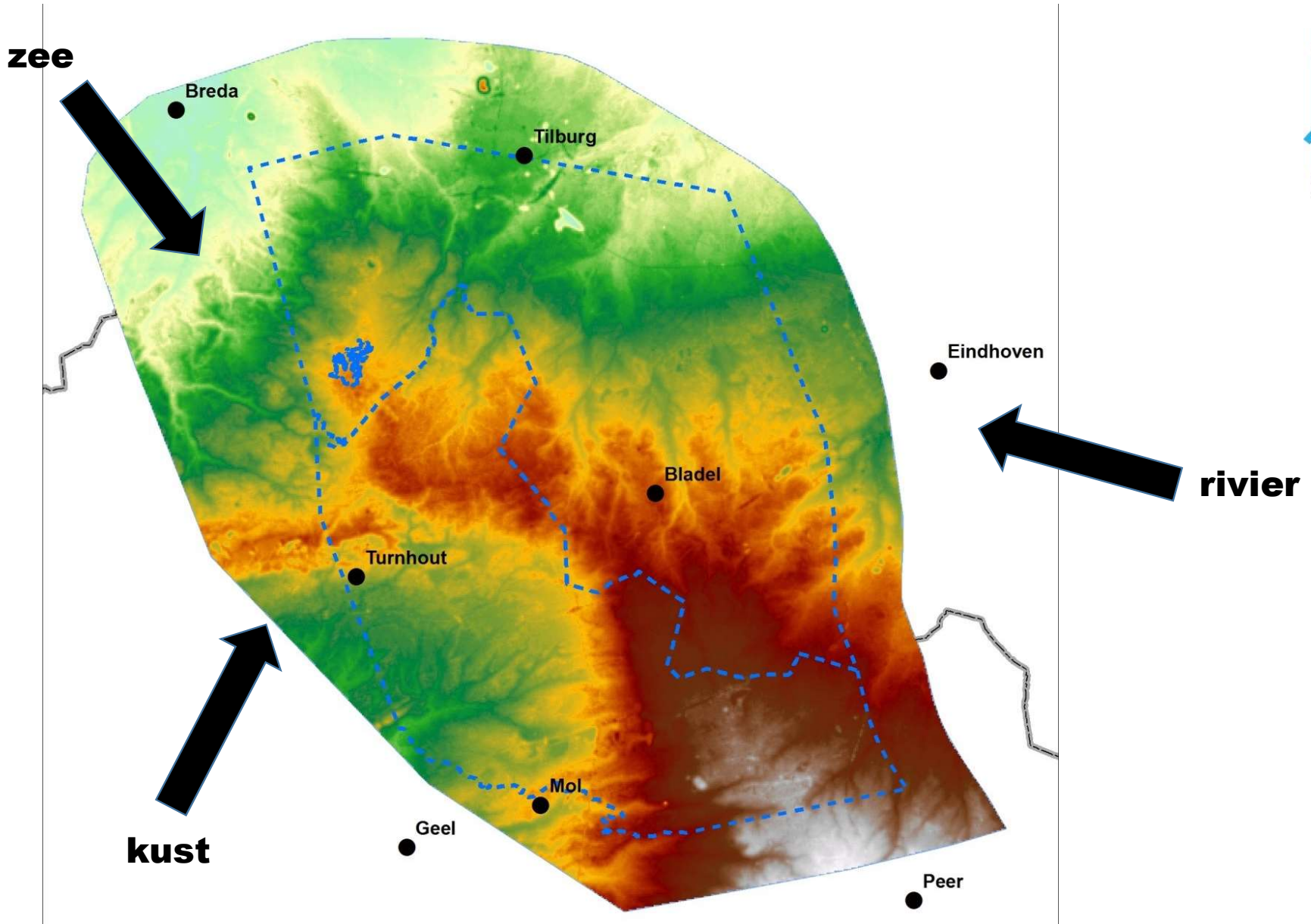


**de moeizame overeenkomst tussen oppervlakkige en diepe geofysische metingen**



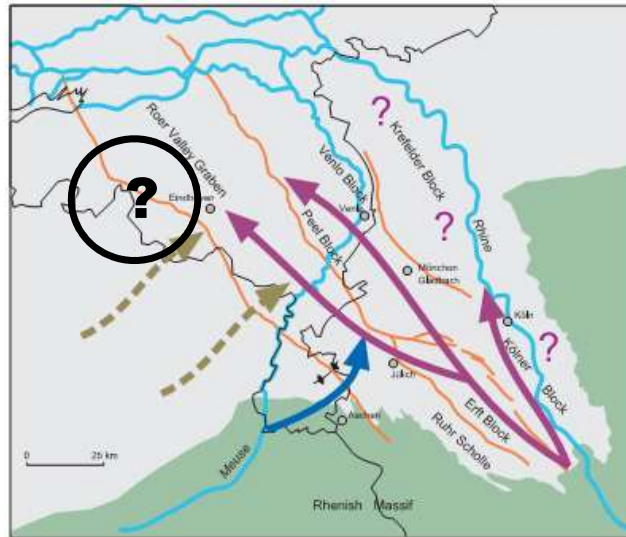


H3O - De Kempen

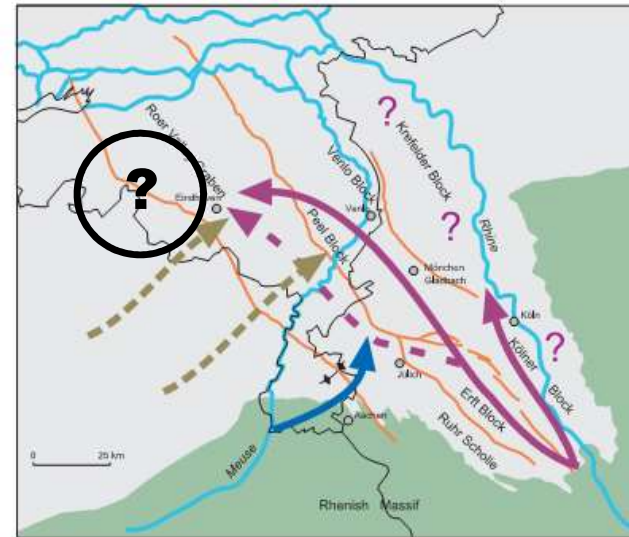




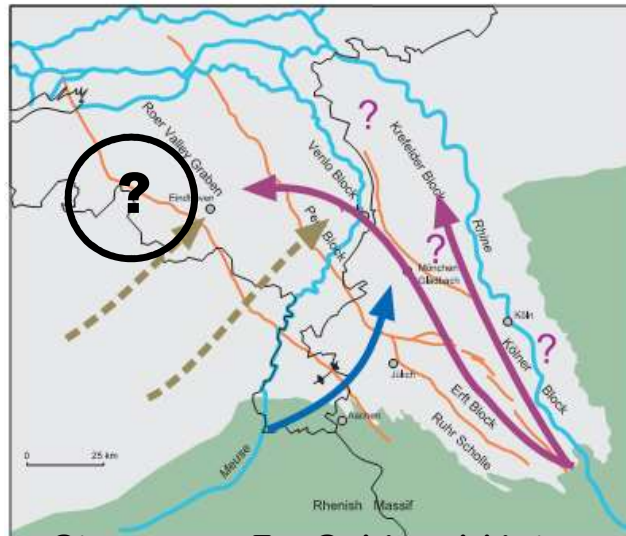
**a confluence area**



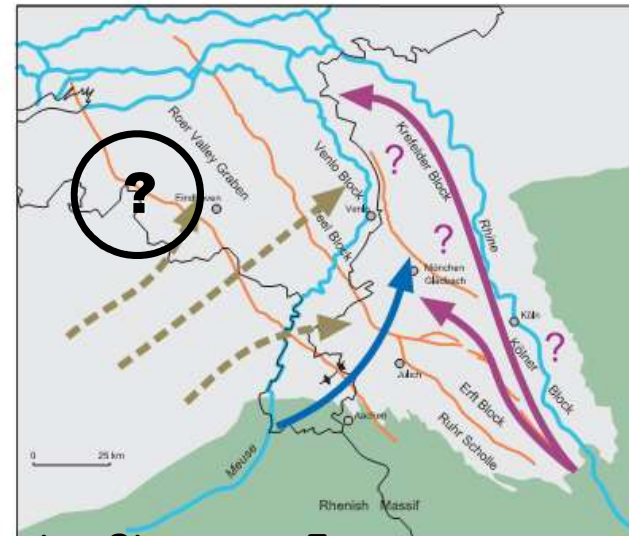
**A top Kiezeloort Fm**



**B Waalre interval**



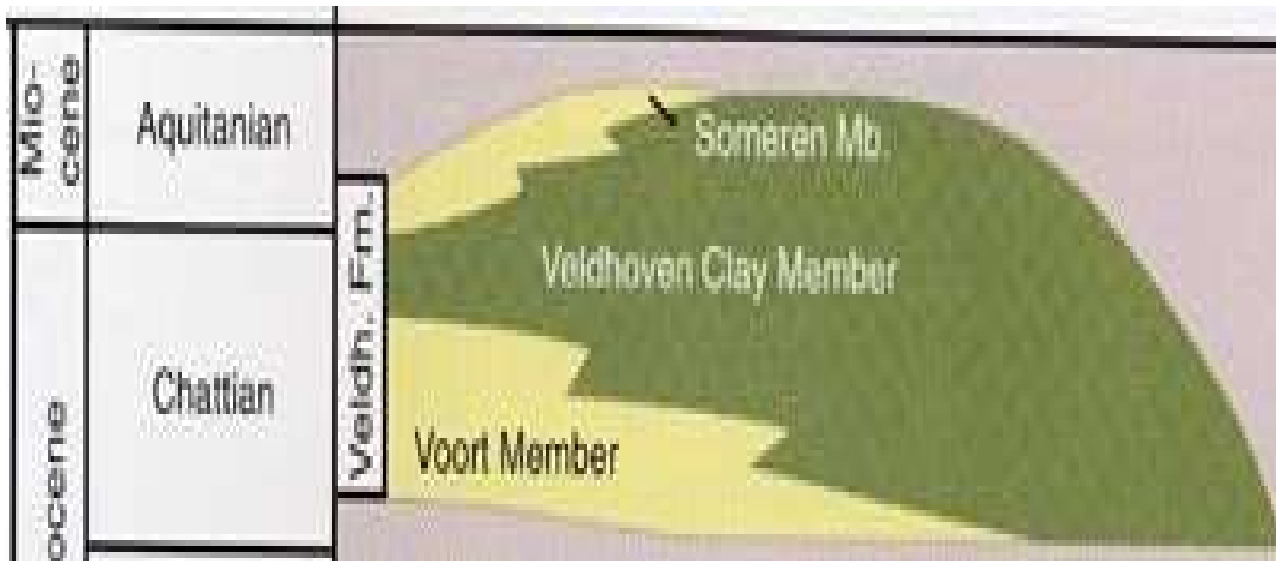
**C Stramproy Fm Schinveld interval**



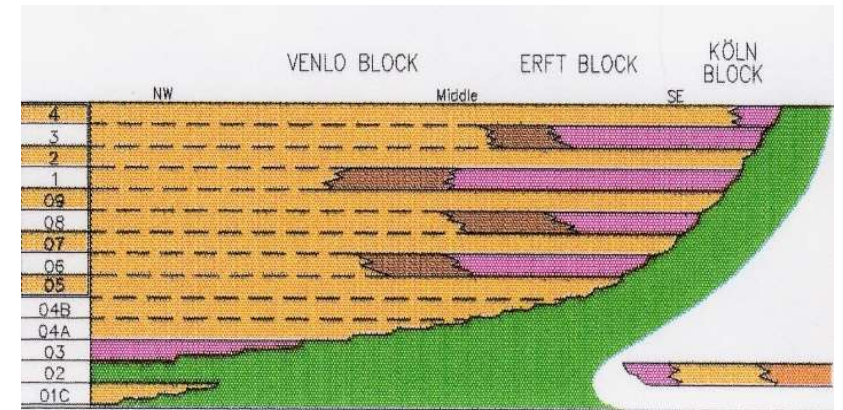
**D top Stramproy Fm**

→ Rhine   
 → Meuse   
 → Belgian rivers





**model Wong et al.**

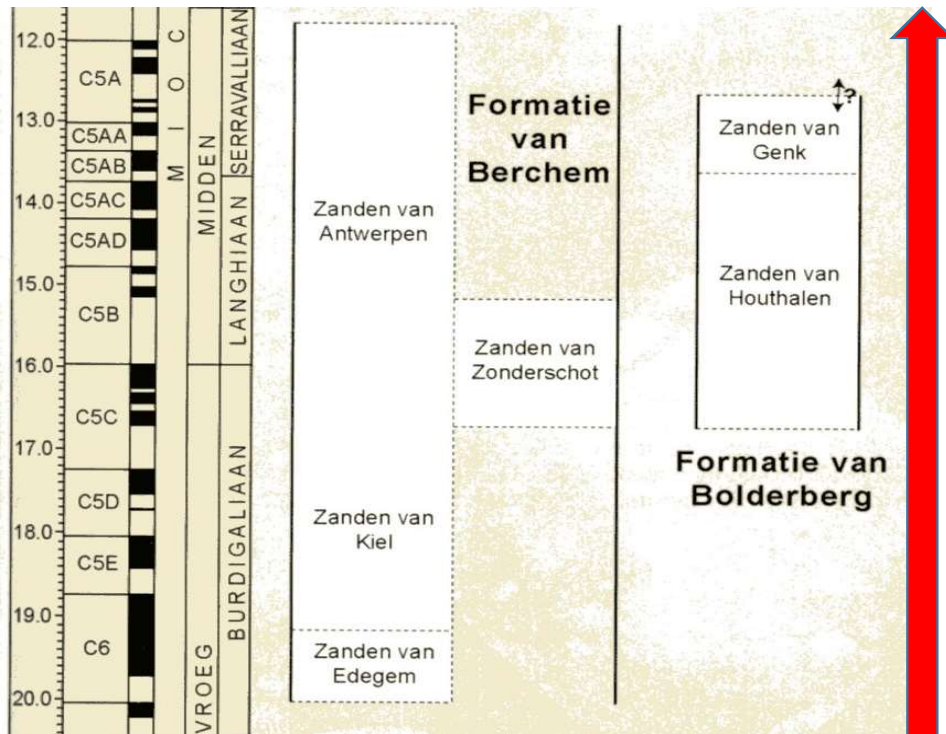


**model Häger et al.**

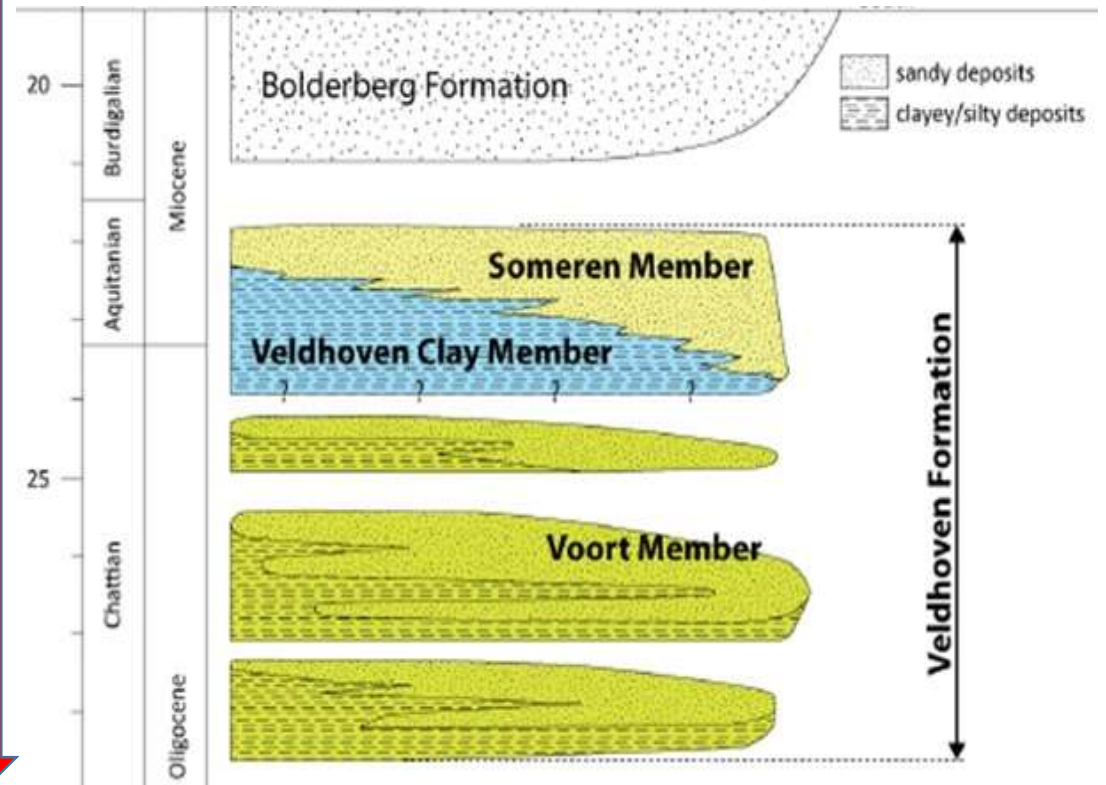
## **Complex van Laat-Oligocene tot Midden-Miocene Zanden**

**2 verschillende tectono-sedimentaire modellen:**

- **Dynamisch volgens zand – klei verdeling**
- **Statisch volgens tektonische pulsen**

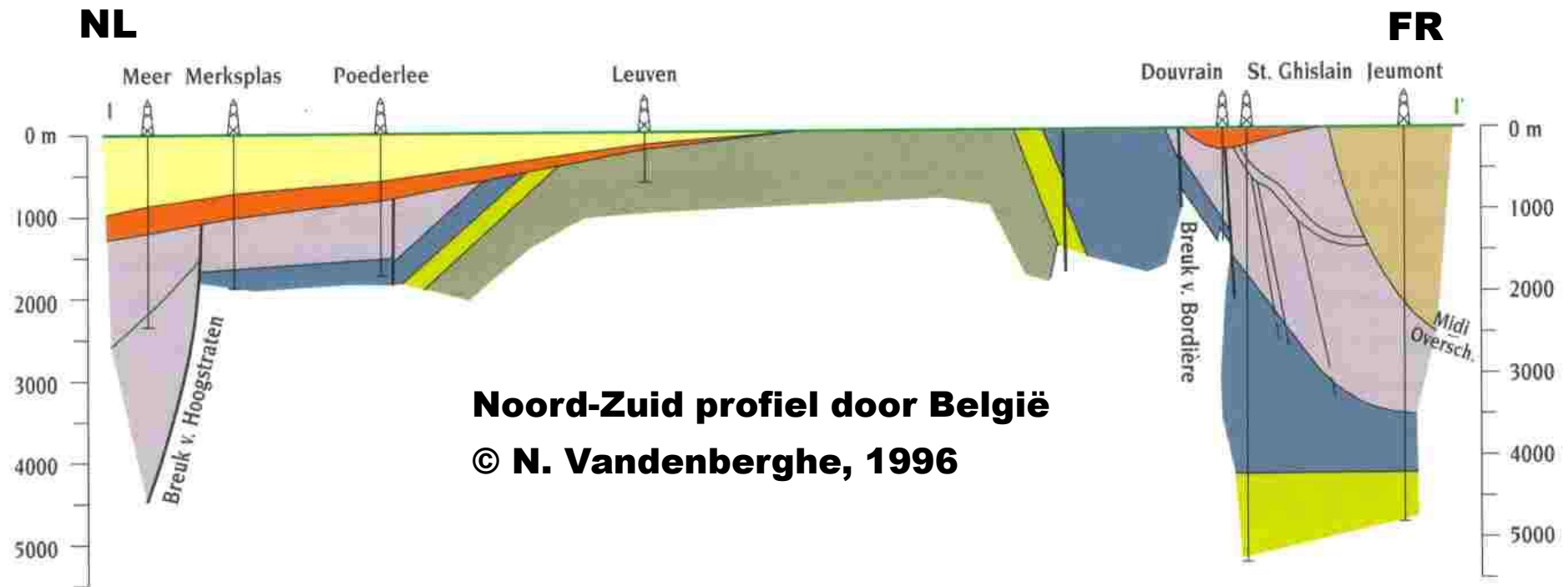


**+ verschillen tussen rand en centrum van sedimentatiebekken**



**Gevolg: groepering in Complex van Laat-Oligocene tot Midden-Miocene Zanden**





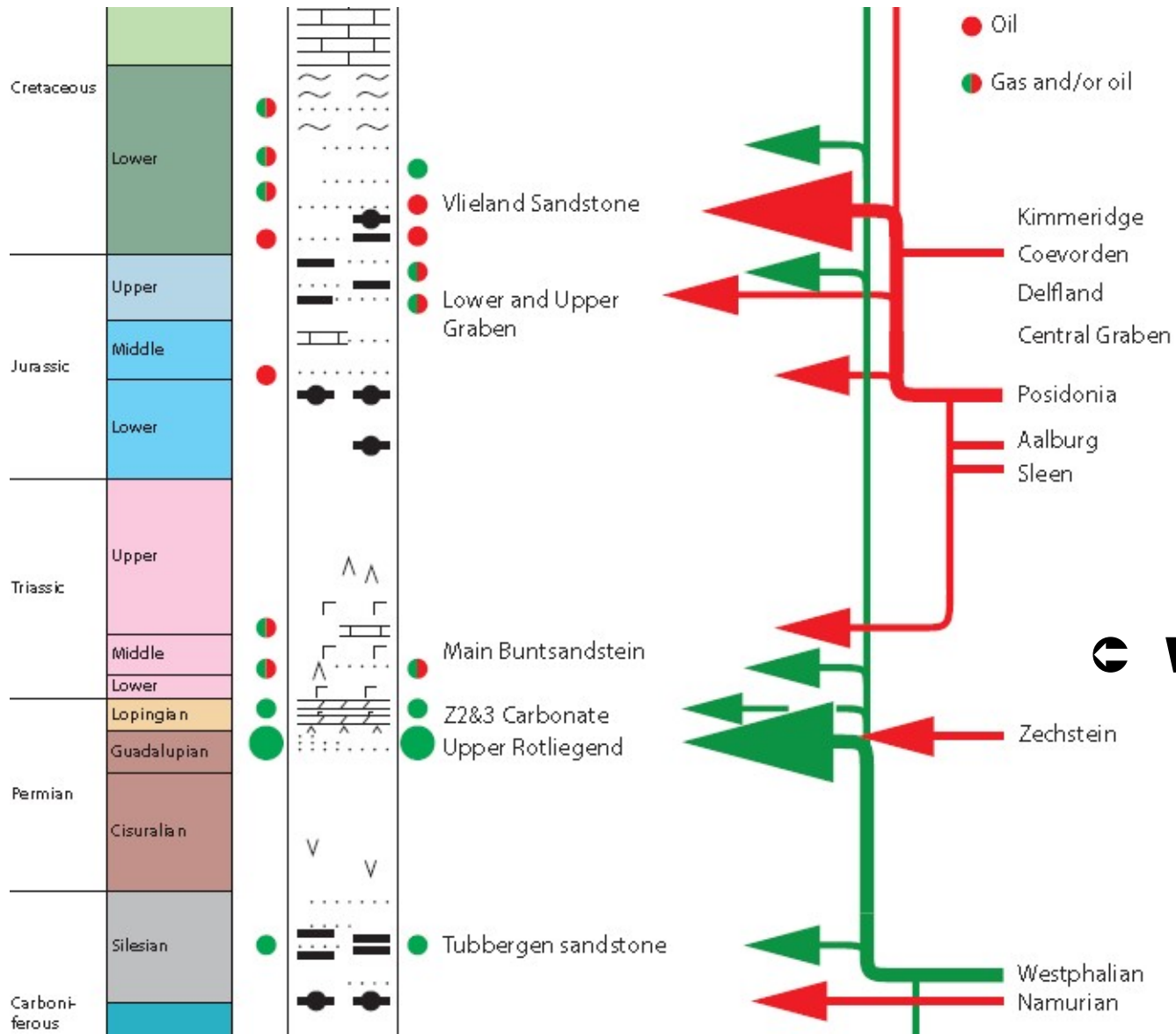
**Wat heeft de diepere ondergrond van de Kempen nog zoal te bieden?**



**Olie- en gasvelden  
in zuidelijk Nederland**

**© Northern Petroleum Inc.  
Google maps**





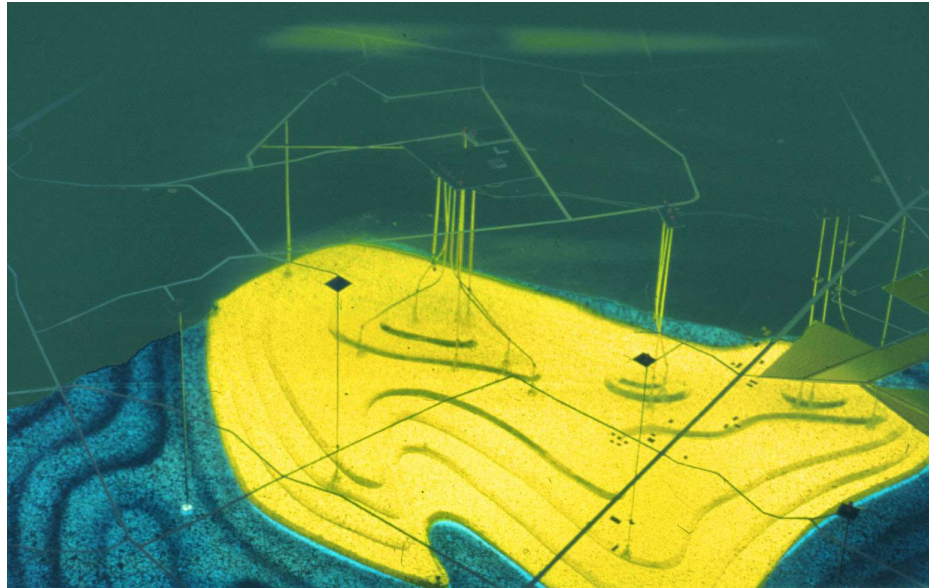
**Petroleumsystemen in NL**  
**De Jager & Geluk**  
**Geology of the Netherlands**  
**KNAW, 2007**

**Waalwijk**

## **Gasopslag site Heibaart (gem. Loenhout)**





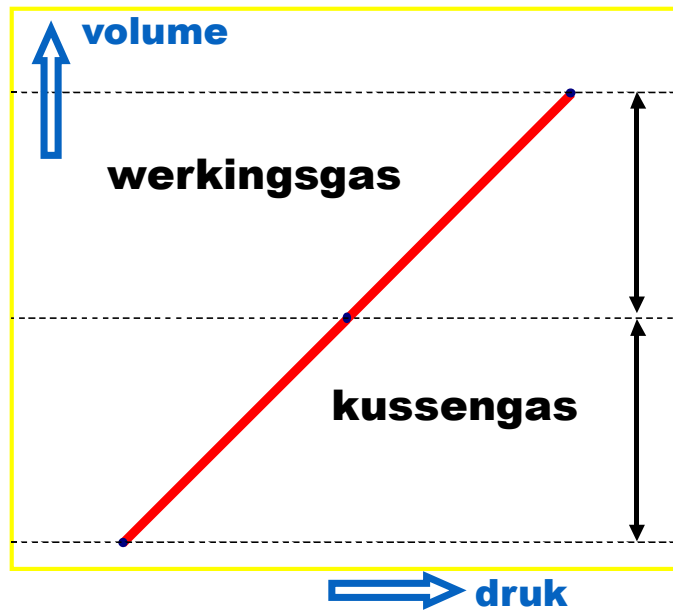


**gasopslag Loenhout**

**model koepel van Heibaart**

**gas - water contact in Dinantiaan  
zoutwater aquifer**

**inplanting boringen en  
exploitatieplatforms ( 1<sup>ste</sup> fase )**





**Steenkoolontginning in de Belgisch Limburgse Kempen**



A large, white, curved informational sign for Brabant Water. The top part is white with blue text, and the bottom part is blue with white text and icons. The background of the sign features a photograph of children playing in a park.

**Welkom**  
**in dit waterwingebied van Brabant Water**

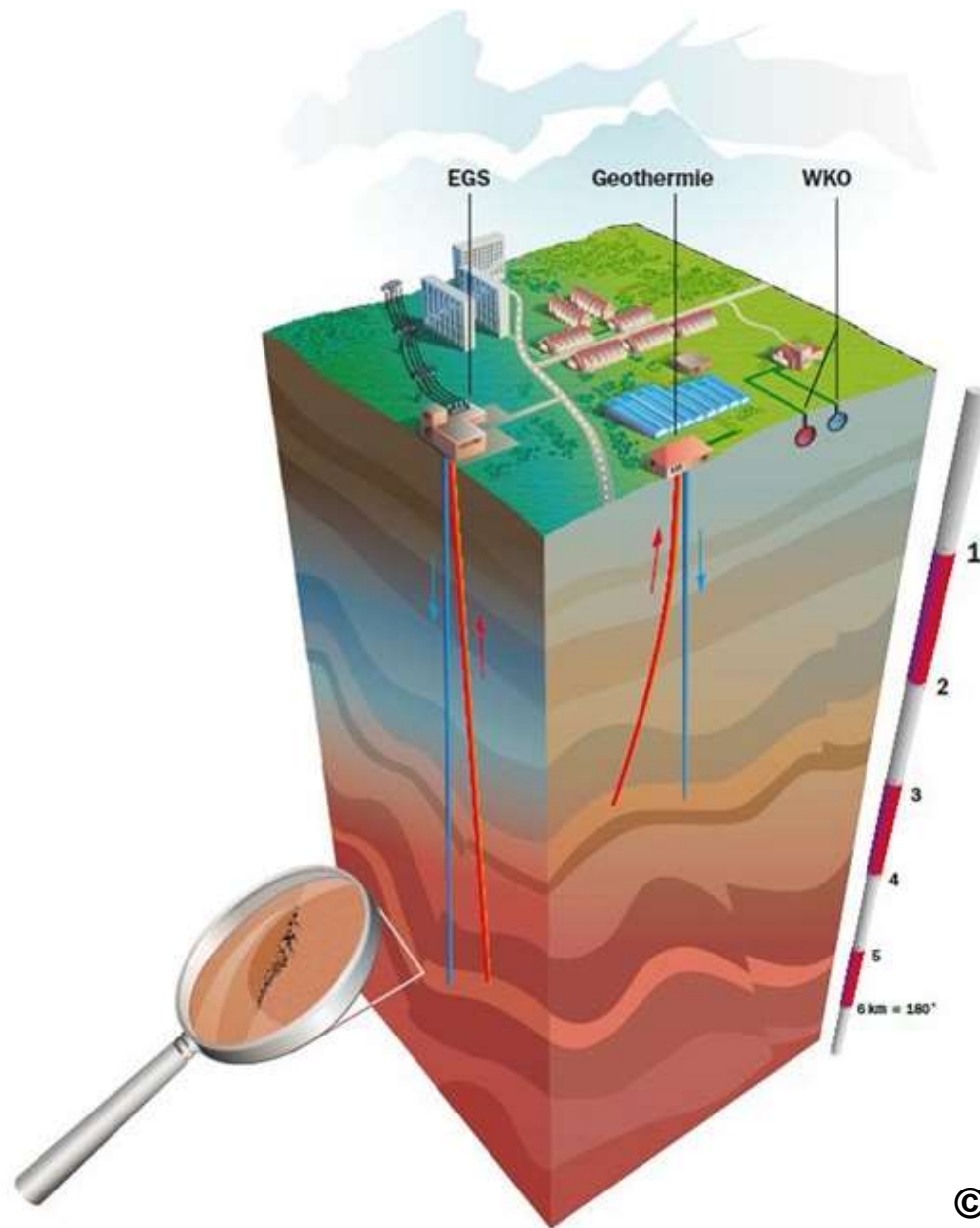
Hier winnen wij grondwater dat diep in de bodem zit.  
Wij maken daar gezond en zuiver drinkwater van dat bij u uit de kraan komt.

Van zonsopgang tot zonsondergang kunt u genieten van dit mooie natuurgebied. U kunt hier wandelen en fietsen maar blijf daarbij wel op de paden. Onder uw voeten bevindt zich de grondstof van uw drinkwater. Ga daarom zorgvuldig om met deze natuur en laat alles schoon achter.

[www.brabantwater.nl](http://www.brabantwater.nl)  
T. 073 683 30 00

**brabant Water**



© TNO





**Onder-Carboon Kolenkalk  
boorkernen**



**verkenningsboring Poederlee  
30W0371**





**Beerse-Merksplas-1**  
**productieput, 1983**  
**TD 1761 m**



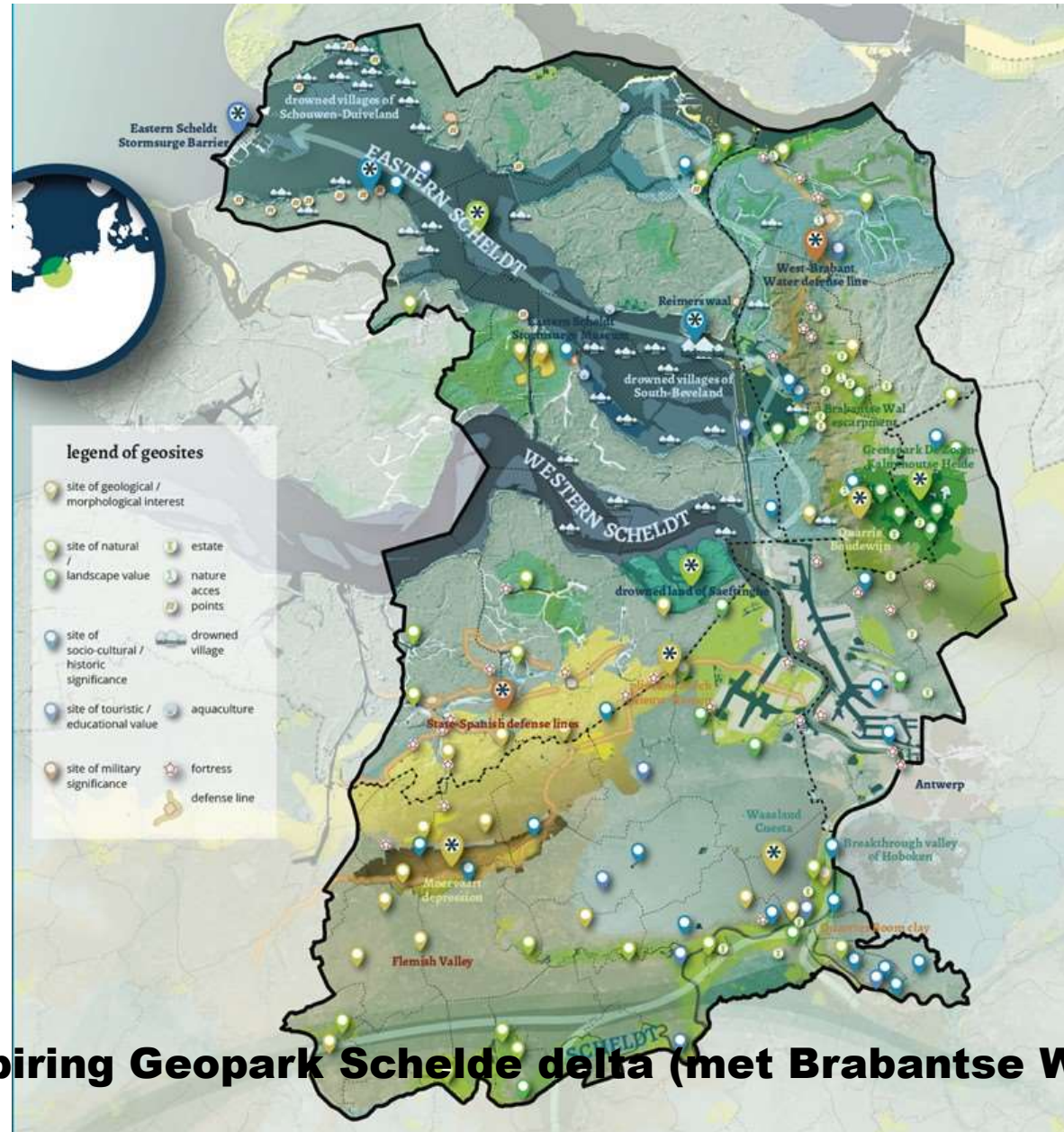


**VITO geothermieboring 3610 m diep 137°C in Kolenkalk  
Balmatt site, Mol  
2016**





**Wat volgt ?**



**grensoverschrijdend Aspiring Geopark Schelde delta (met Brabantse Wal)**





**Wim Westerhoff †**