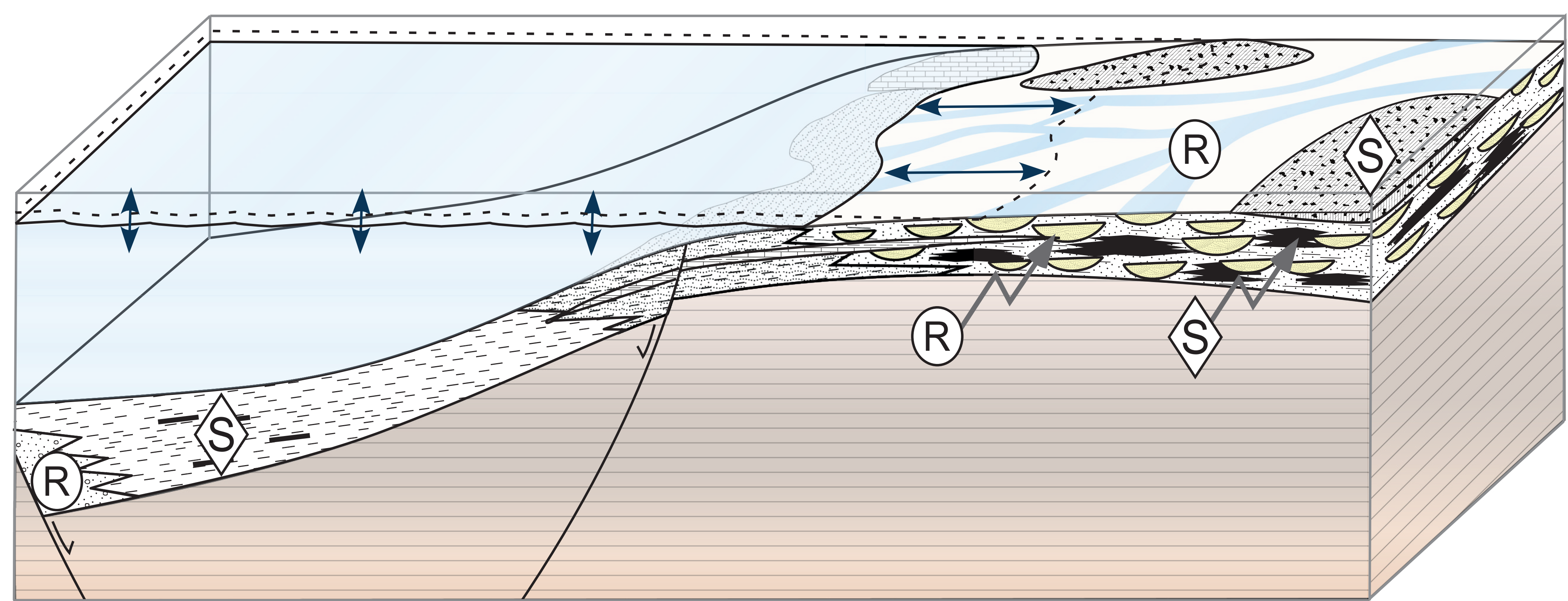


Exploring Paleozoic strata in the northern Dutch offshore

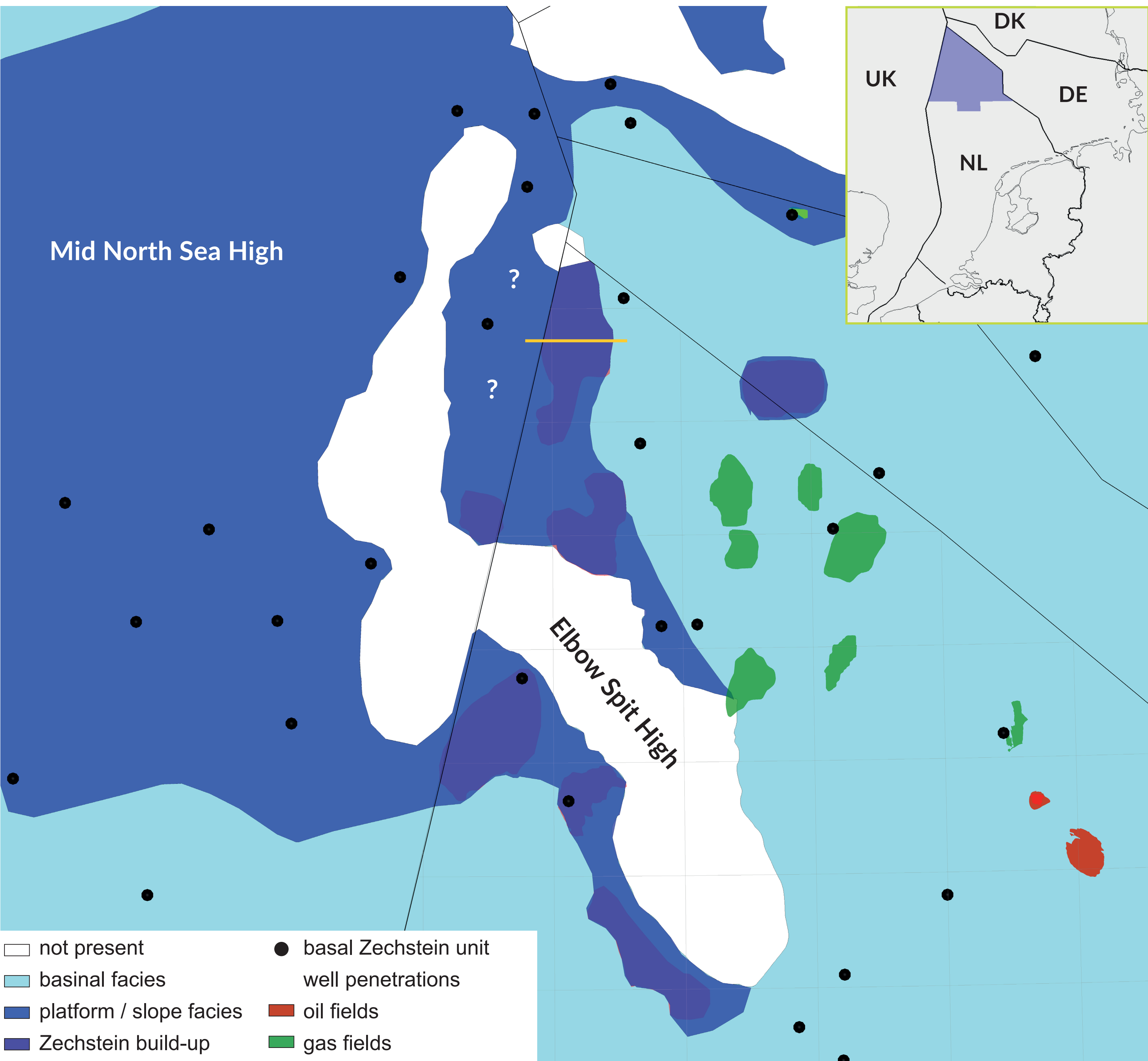
Extending the Dinantian clastics play the Dutch northern territory



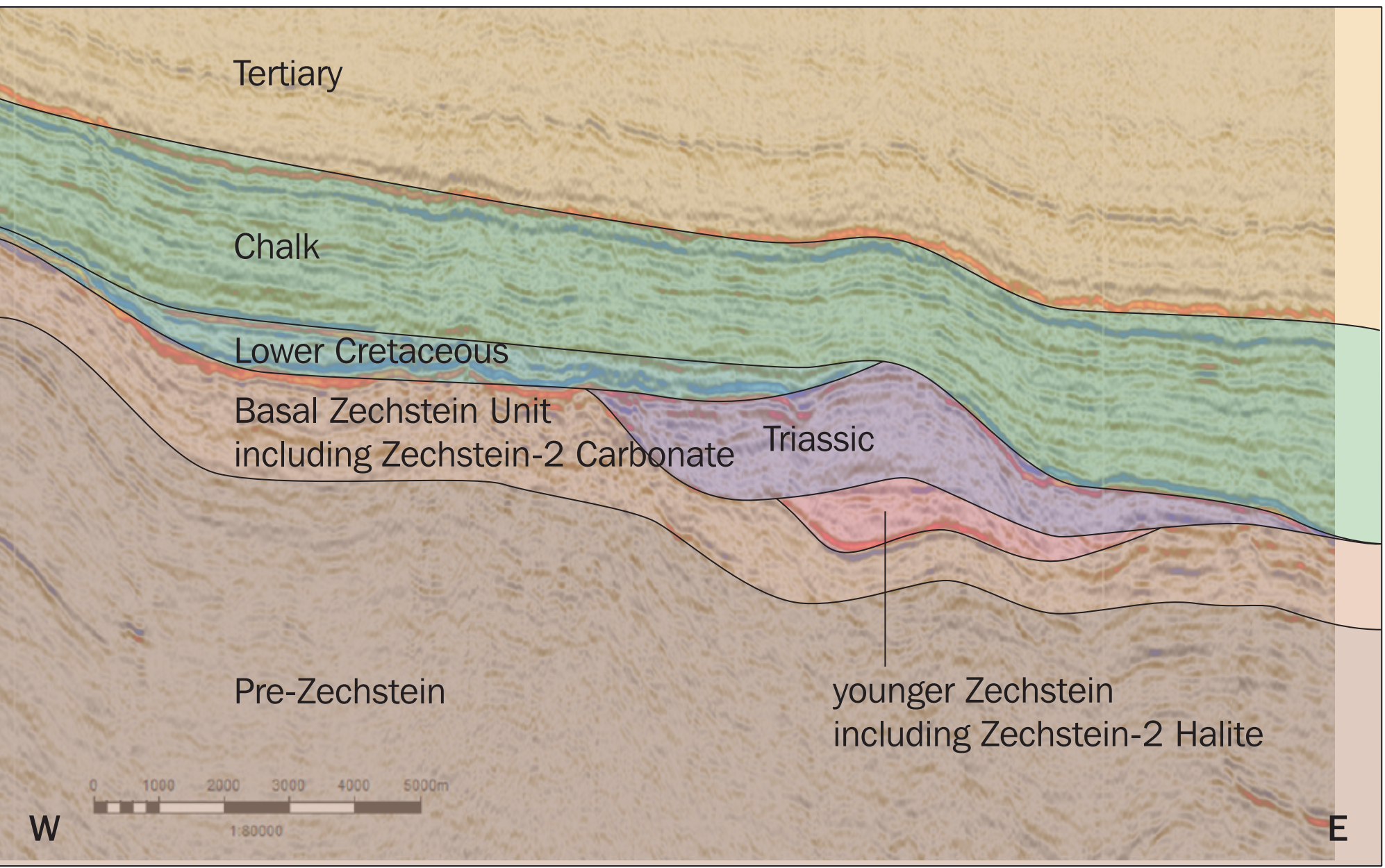
- Development of UK Breagh field shows potential of Dinantian clastics play.
- Play underexplored, preliminary results show the potential of the play in the study area.
- A new tectonic framework has been developed (see poster& presentation We-N103-07) to predict the occurrence of Lower Carboniferous source and reservoir rocks.
- A detailed play fairway analysis is forthcoming.

The Dinantian (Early Carboniferous) clastics play. S – Source Rock, R – Reservoir. Seals are provided by Zechstein salt, Silverpit Fm. and intra-Carboniferous seals.

A new chance for the Zechstein-2 play



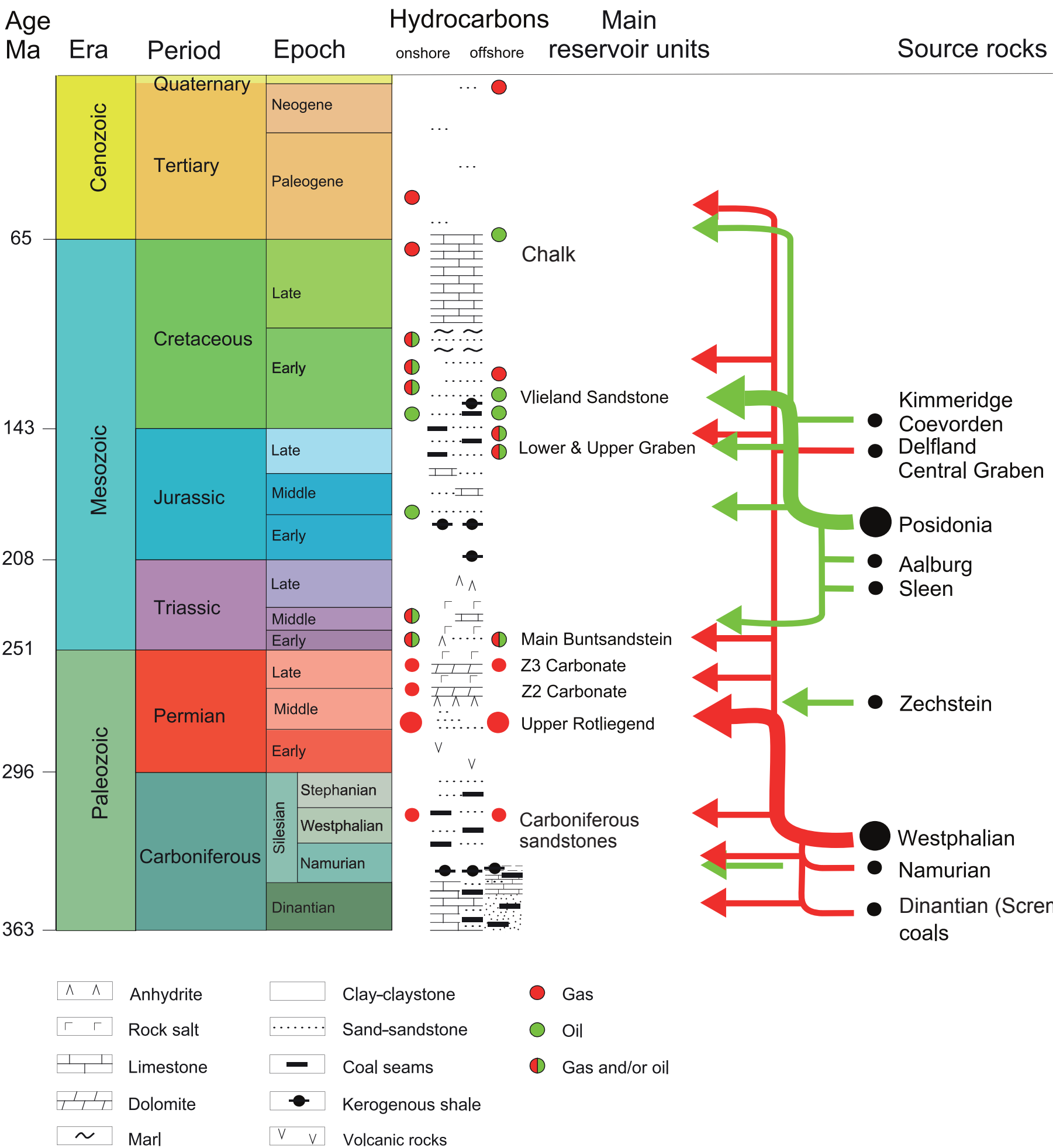
- Proven play in Southern Permian Basin - production in Poland, Germany and the Netherlands.
- Presence of Zechstein-2 Carbonates in study area shown by wells and seismic.
- Possibly charge from Dinantian Scremerston coals and/or Zechstein carbonates.
- Cluster of leads with sizable volumes, nearby infrastructure.



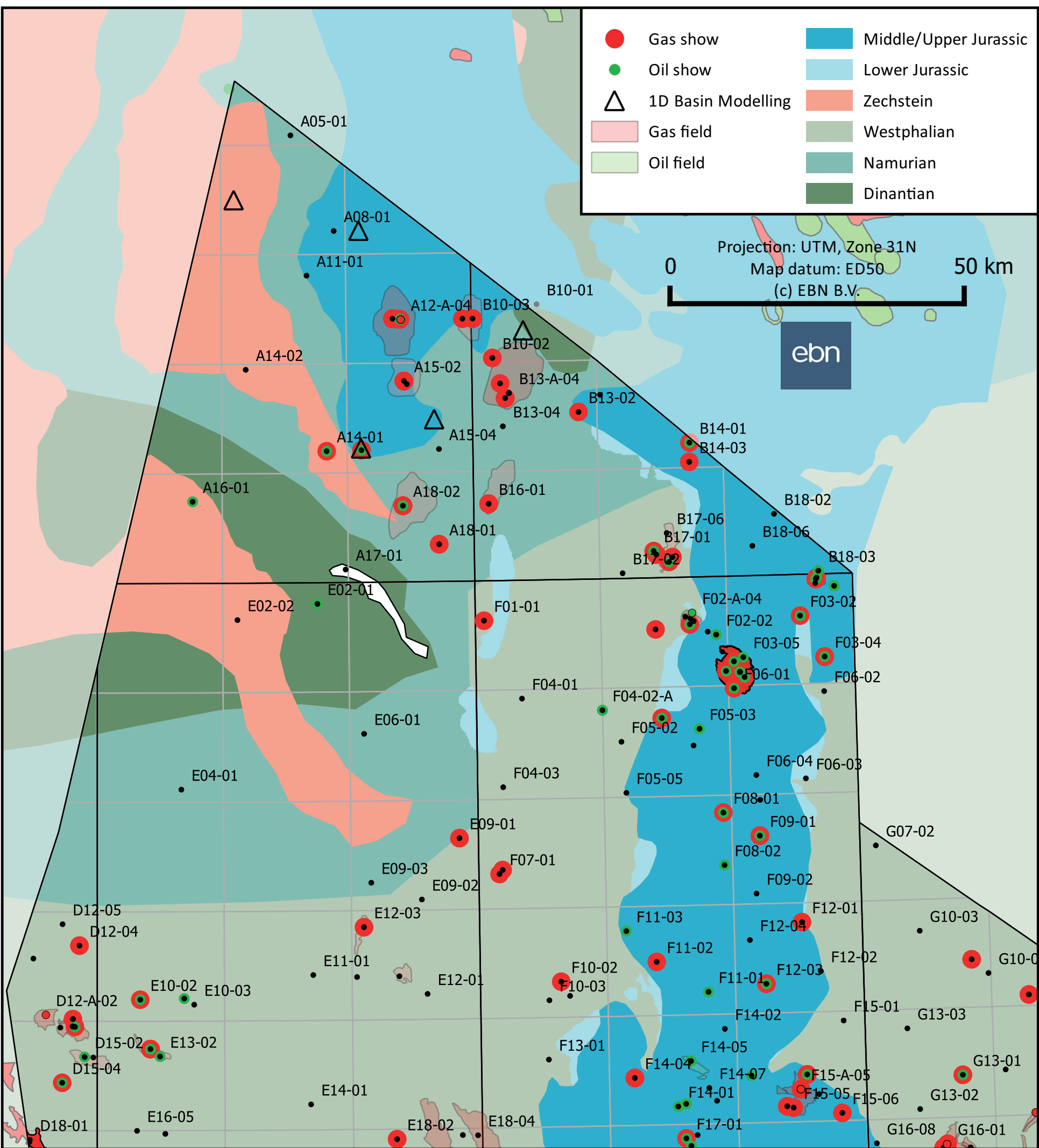
Trap	Carbonate platform / slope
Reservoir	Karstified / fractured limestone
Seal	Overlying Zechstein strata (clays, salts) Overlying Cretaceous - Jurassic shales, tight Chalk
Source	Zechstein intra-platform (oil / condensate, lateral migration) Carboniferous coals (gas, vertical migration)

Facies and present-day distribution of the Zechstein-2 Carbonate Member, modified from Geluk, 2007

Positive indications for source rocks



Hydrocarbon systems in the Netherlands, modified after Wong, Batjes and de Jager, 2007



- Hydrocarbon shows outside areas with proven source rocks and also in pre-Tertiary strata.
- Some non-biogenic signatures are identified in Tertiary deposits (Swint, 1999).
- This strongly suggests that other source rocks are present and mature in the area.
- 1-D basin modelling results show that Zechstein-2 carbonate, Scremerston and Yoredale coals, and Namurian source rocks are all currently at maximum burial. Hydrocarbon generation picks up in the Tertiary with a strong peak in the mid Miocene.

Distribution of potential source rocks in Northern Offshore and hydrocarbon shows in wells.