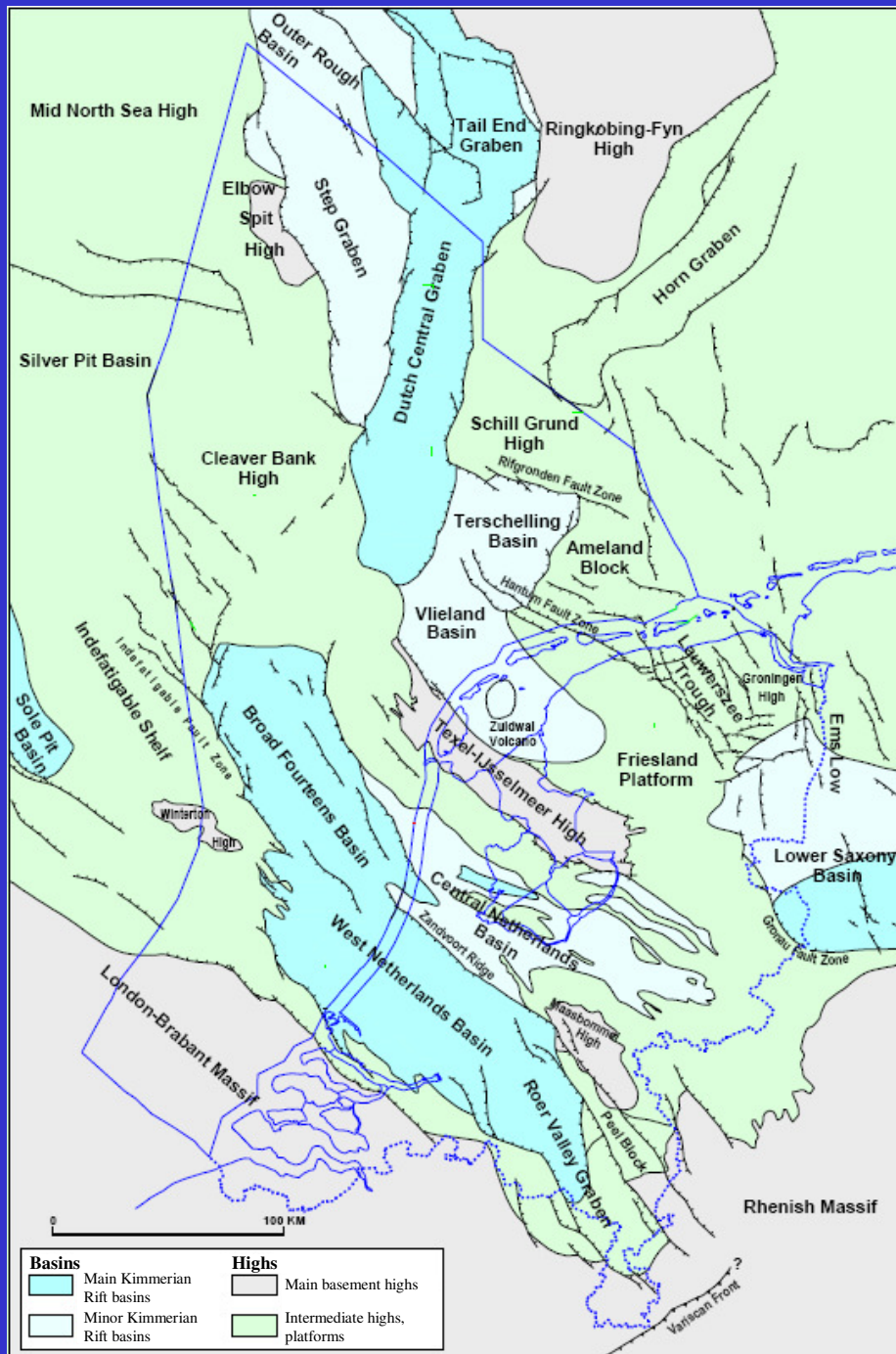


Introduction to Rifting Systems and their significance for Hydrocarbon Exploration in the Netherlands

Jan de Jager



Petroleum system types

4

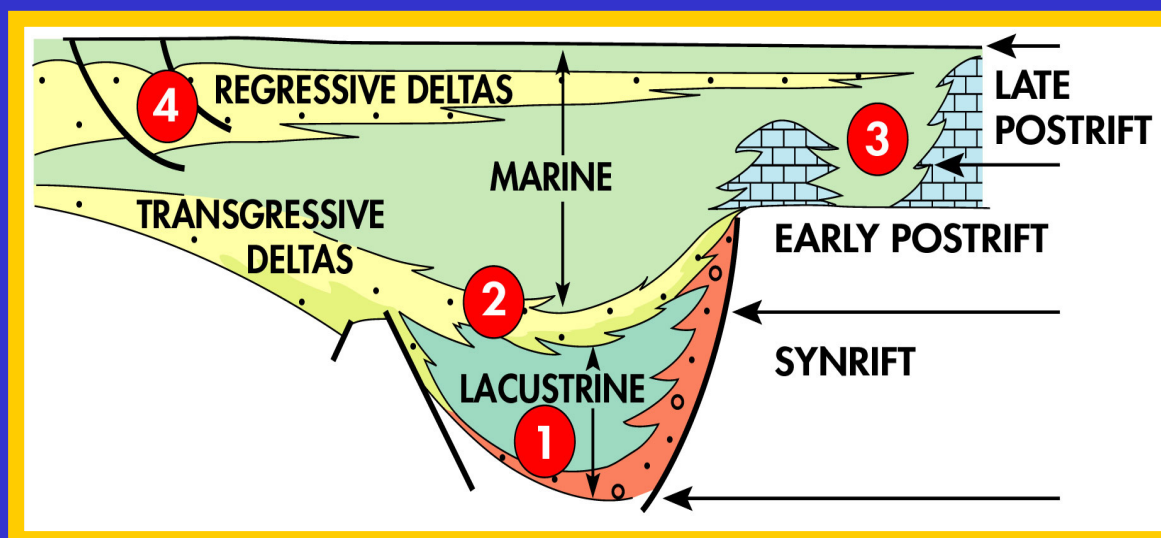
Late Postrift Regressive Deltaic Petroleum System (Oil/Gas prone)

- Paralic, late postrift, MiM-Recent, major deltas on continent margins (except Malay)
- Fluvial deltaic coaly shale SR (type II/III)

3

Early Postrift Marine Petroleum System (Gas/(Oil) prone)

- Early-middle postrift, MiL-MiM
- Gas prone Intradeltaic SR (type II/III); neritic clays
- Oil-gas prone Fluvial-deltaic SR (type II/III); allochthonous land plant material
- Oil prone? Open marine SR (type II/III)



2

Late Synrift Transgressive Deltaic Petroleum System (Oil/Gas prone)

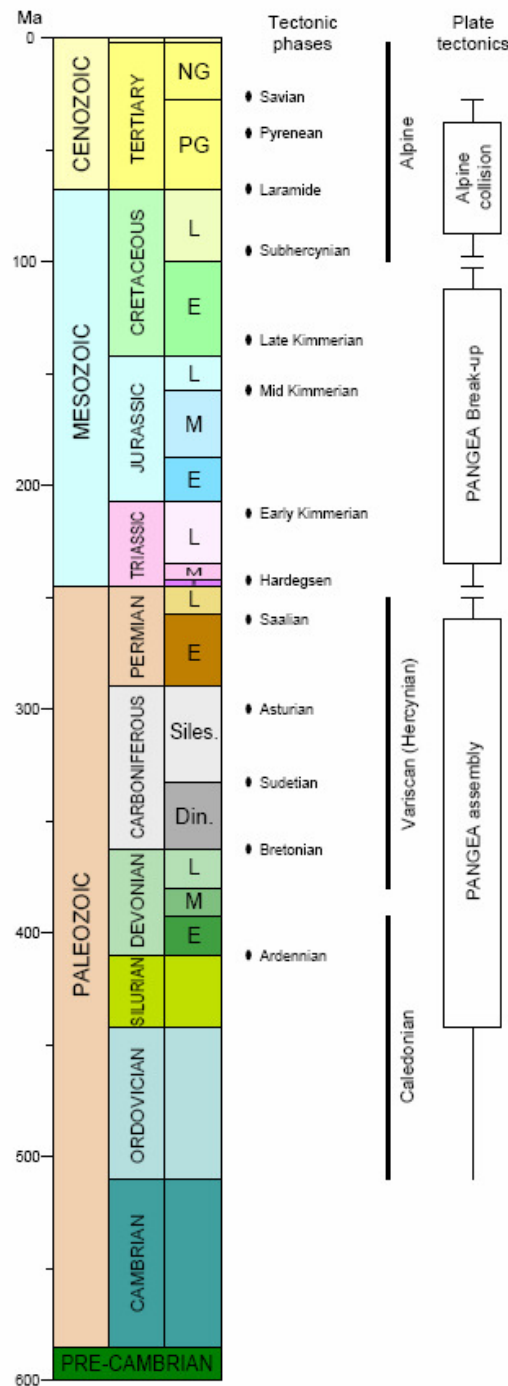
- Paralic, synrift-early postrift, Oi-MiL, backstepping transgressive
- Fluvial deltaic coals and coaly shale SR (type II/III)
- Regional transgressive marine shale top seals

1

Early Synrift Lacustrine Petroleum System (Oil prone)

- Non-marine synrift, Pg-MiL
- Oil prone deep/fluvial lacustrine SR (type I/II/(III))
- Gas prone marginal swamp SR (type II/III); limited

From Doust and Lijmbach,

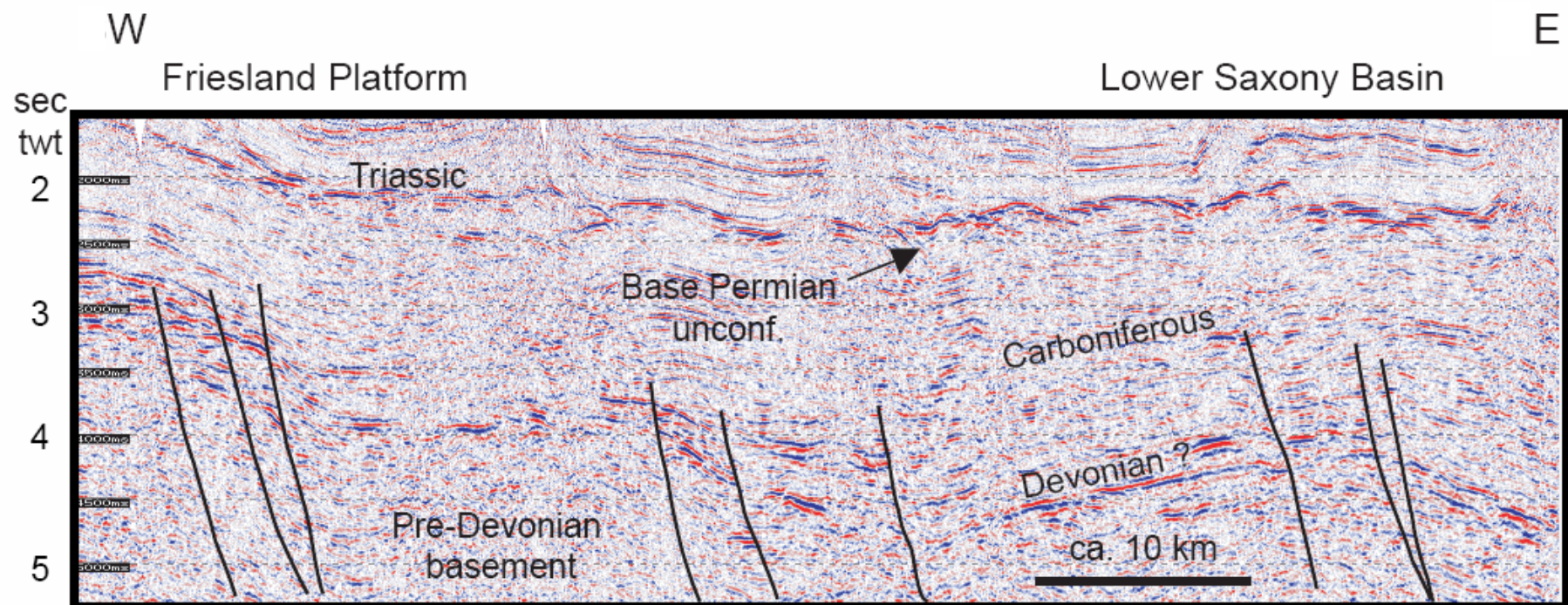


**Inversion of
Mesozoic rift basins**

**Main rifting phase
in the Netherlands
is Mesozoic**

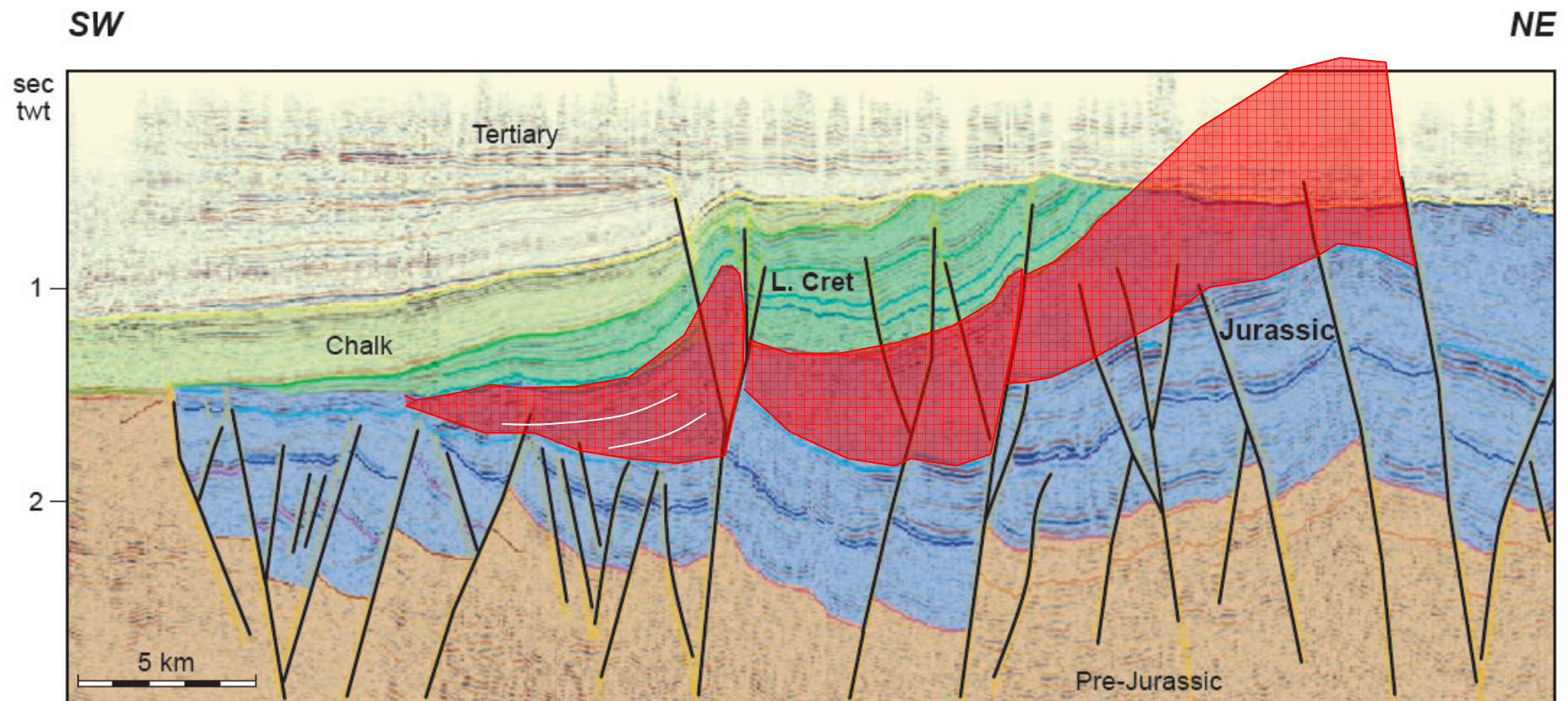
**Older Phases
Of rifting**

Older Phases of Rifting



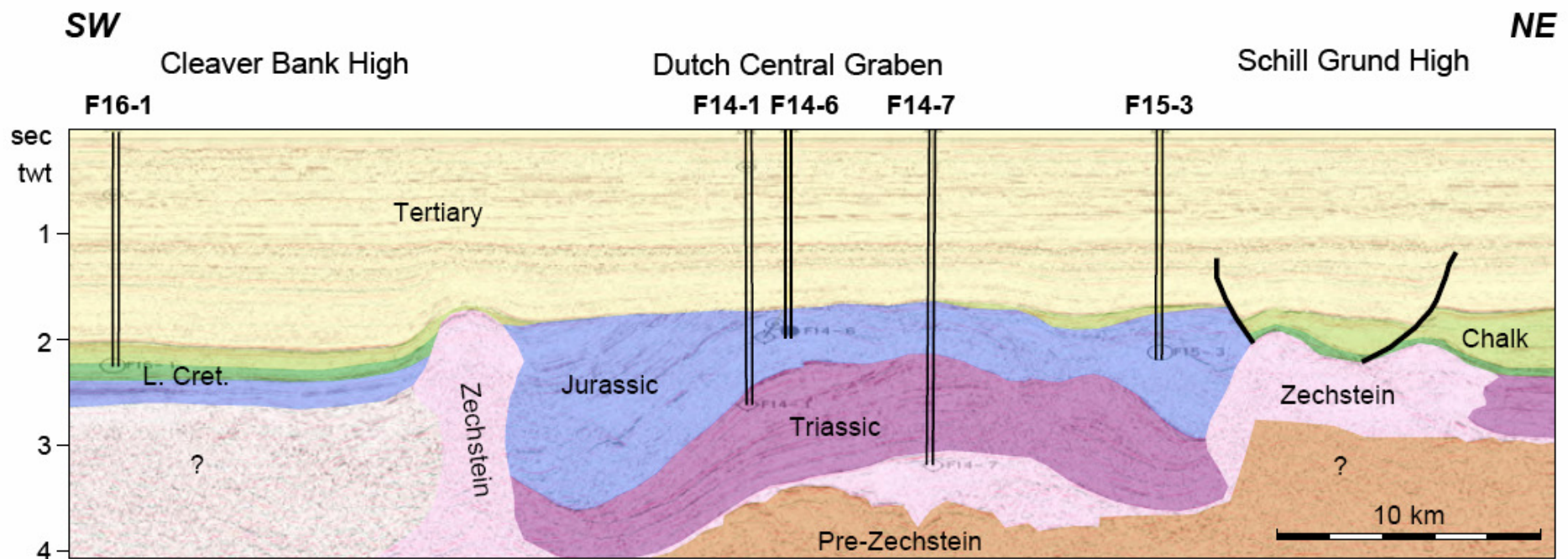
West Netherlands Basin

Classic Halfgrabens



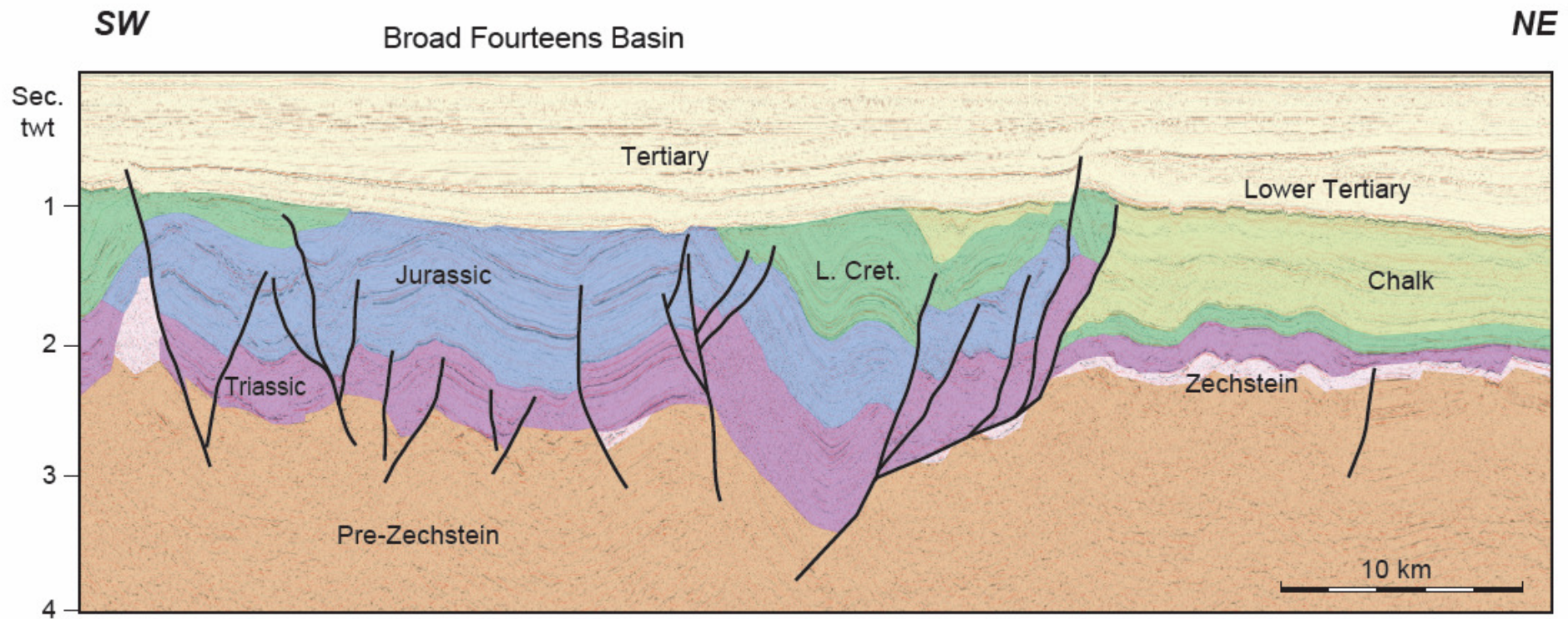
Dutch Central Graben

Rifting in a Basin with Thick Salt

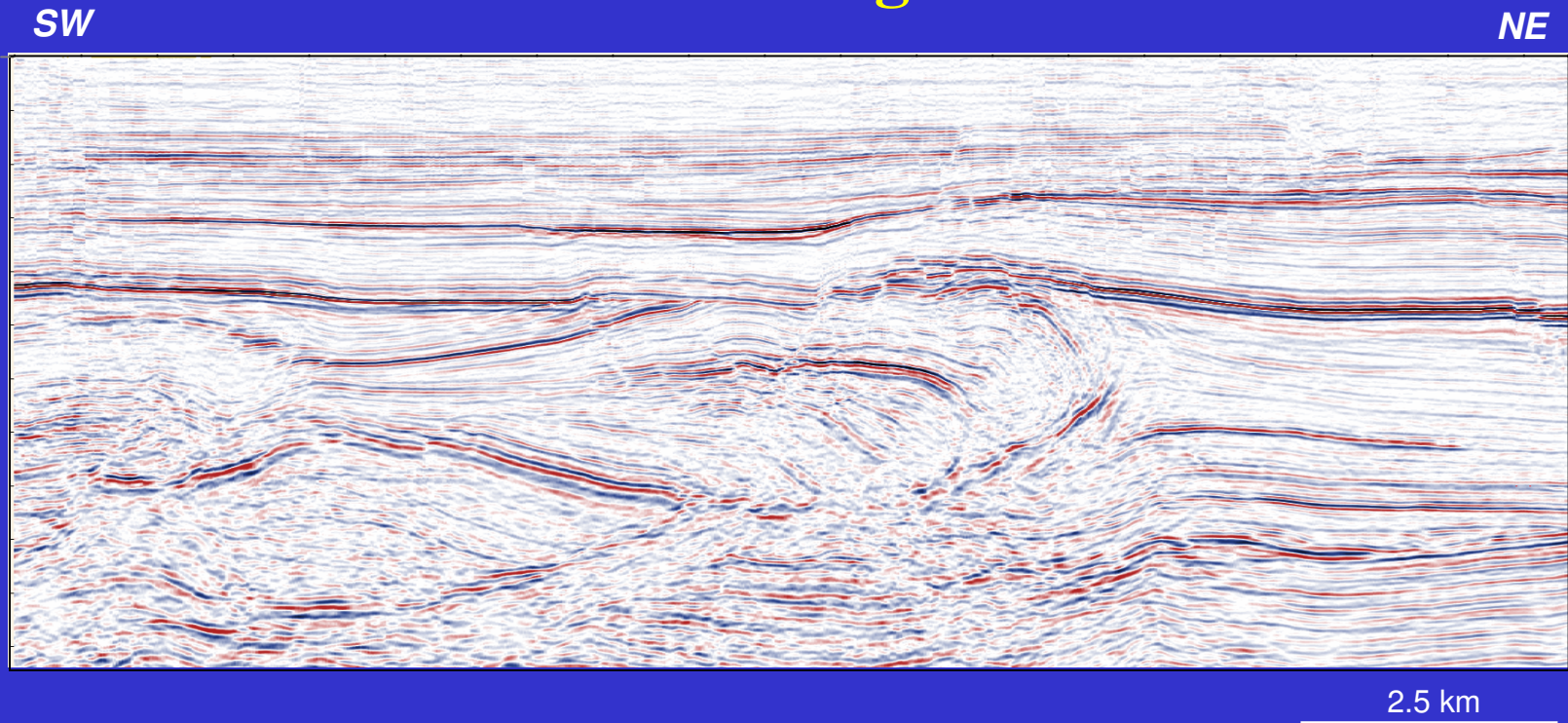


Broad 14s Basin

Rifting in a Basin with Thin Salt



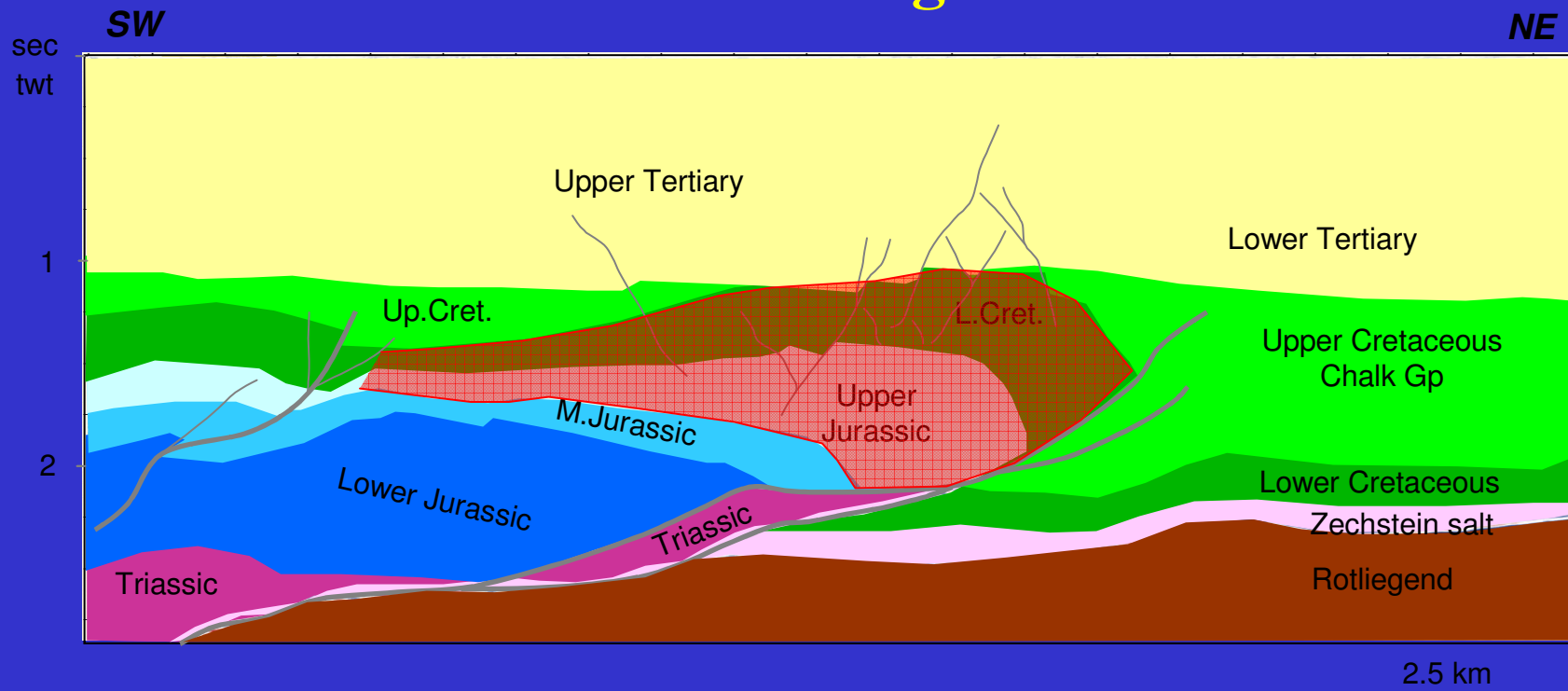
Broad 14s Basin Inverted Halfgraben



Seismic time section displayed at approximately 1:1, illustrating the impressive inversion of a syn-rift sequence on the eastern flank of the Broad 14s Basin.

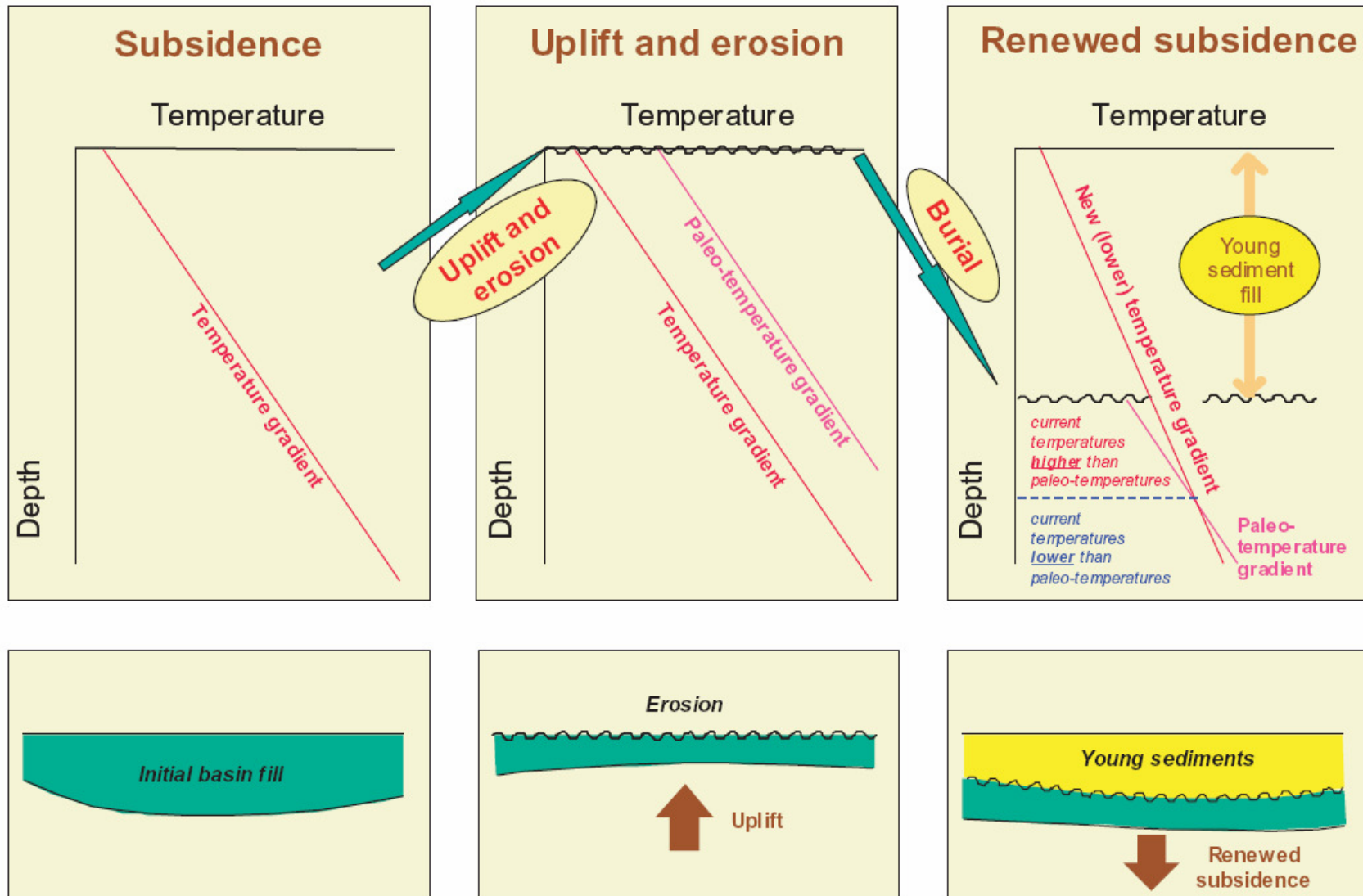
Broad 14s Basin

Inverted Halfgraben



Seismic time section displayed at approximately 1:1, illustrating the impressive inversion of a syn-rift sequence on the eastern flank of the Broad 14s Basin.

Rifting, Inversion and Burial Effects on Temperature History



Rifting Systems and Hydrocarbon Exploration

- **Petroleum System Thinking**
 - Types and presence of Source Rocks
 - Temperature and expulsion history (*inversion!*)
- **Reservoirs and Seals**
 - Distributions and trends within rift basins
- **Traps**
 - Trap types and understanding of fault trends