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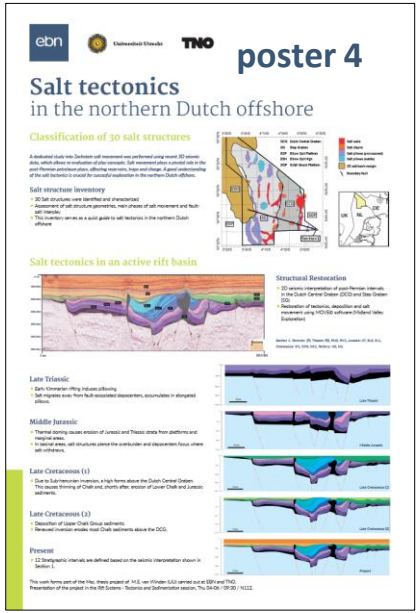

- MSc at EBN / TNO Matthijs van Winden (‘14-’15) – report / presentation (EAGE, PGK) available. project co-supervised by Dr. Renaud Bouroullec (TNO)
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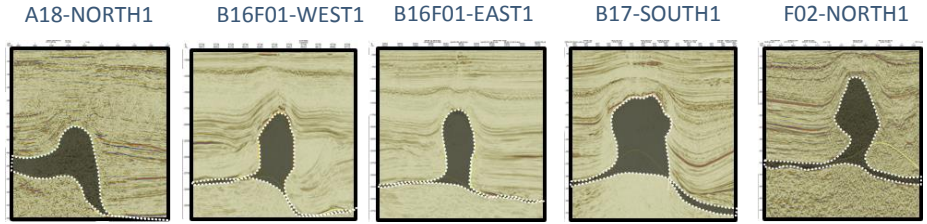
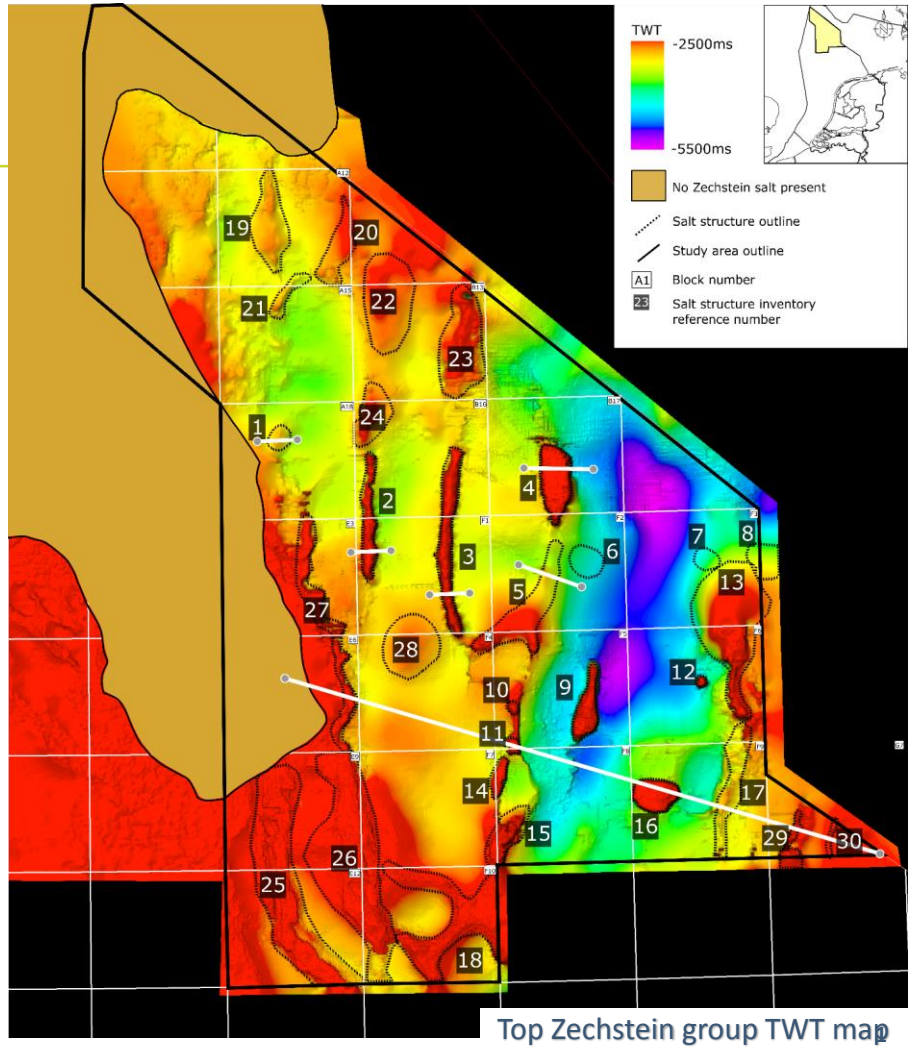
Salt structure inventory

30 salt structures, 35 characteristics



30 salt structures identified and described in detail according to 35 characteristics:

- Orientations and dimensions
- Associated faults
- Associated stratigraphic relationships
- Data and Locations



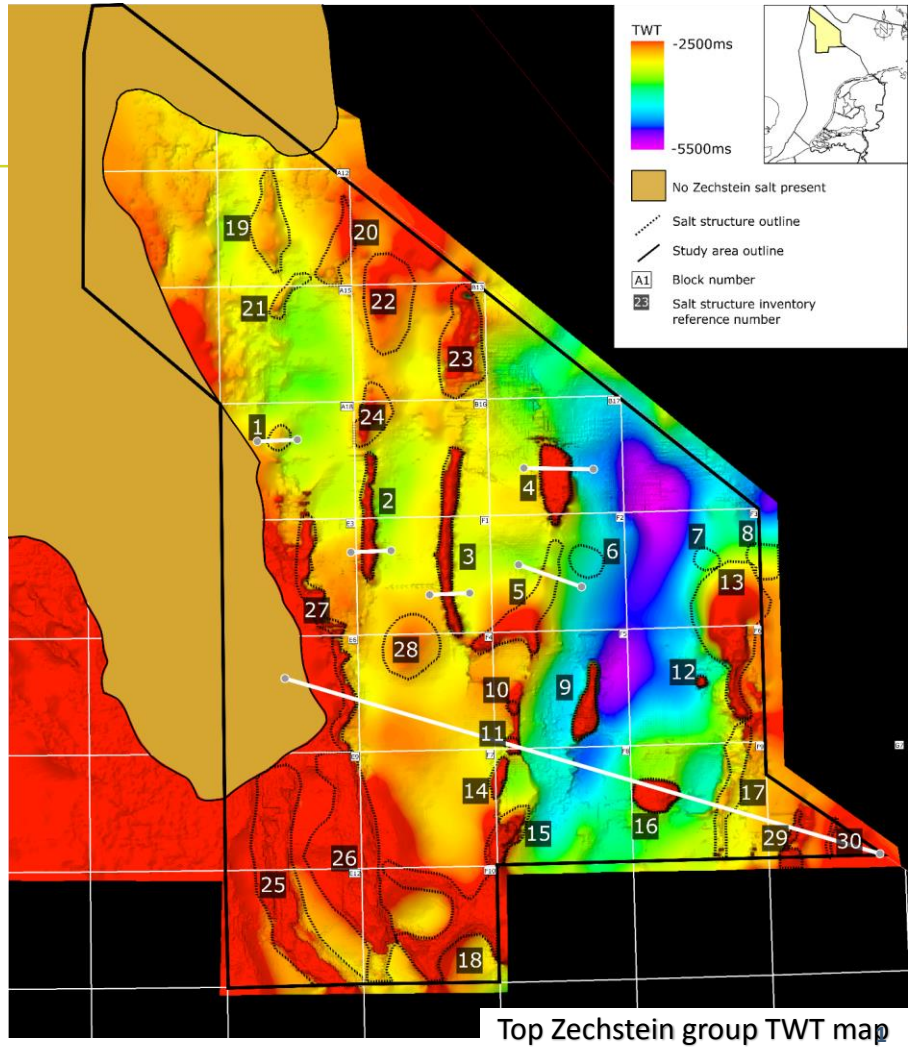
Top Zechstein group TWT map

Salt structure inventory

regional summary compiled

History varies throughout the study area. Salt movement is closely linked to tectonics, deposition and position within structural elements

- Triassic:
  - Intitiation of salt movement – formation of elongated pillows, depocenters
  - Thin-skinned tectonics, soft-linked faulting
- Jurassic:
  - Salt tectonic climax in the DCG, SG – formation of salt walls and diapirs
  - Depo-centers focus where salt withdraws
- Cretaceous and Tertiary
  - Renewed salt movement – phases of vertical growth in diapirs, walls and pillows
  - Pulses of inversion

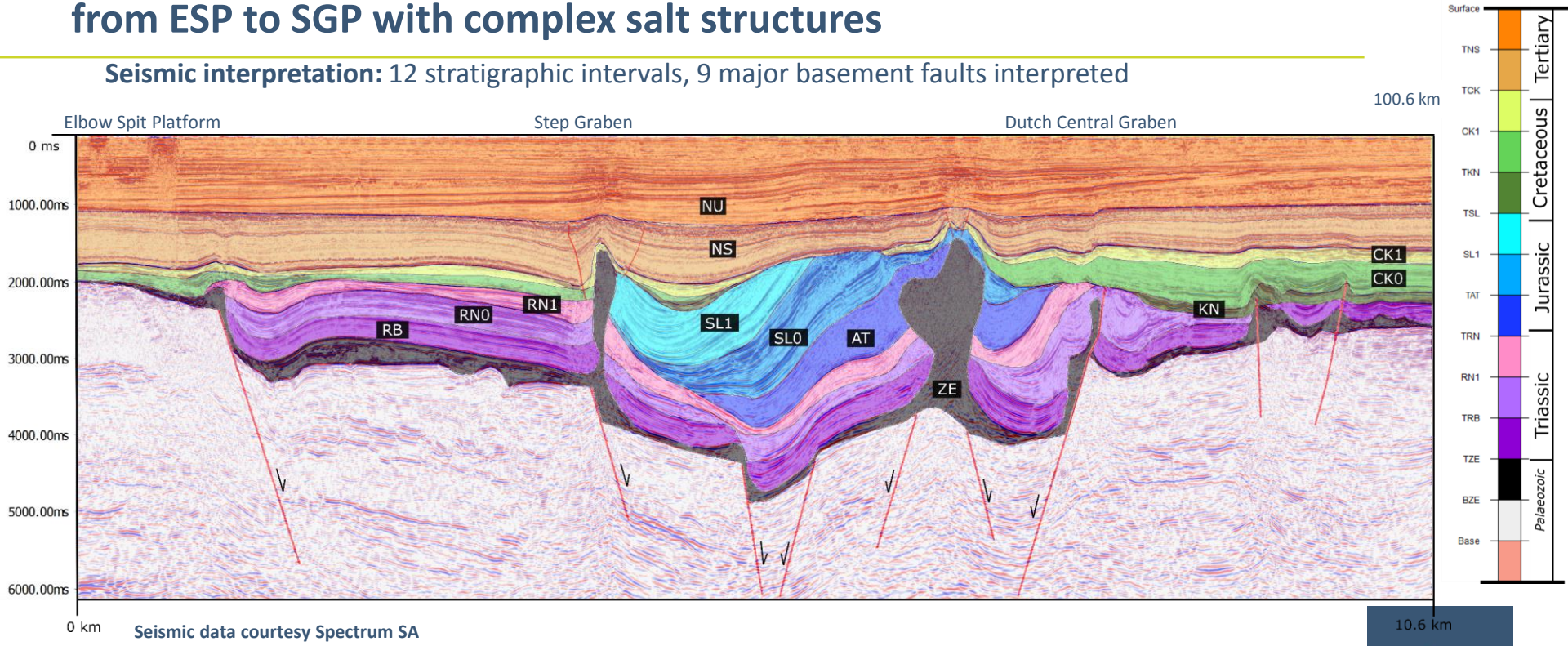


Top Zechstein group TWT map

Structural restoration of regional section (100 km)

from ESP to SGP with complex salt structures

Seismic interpretation: 12 stratigraphic intervals, 9 major basement faults interpreted



Seismic data courtesy Spectrum SA

Analysis of salt tectonics and development of individual structures within a structural context

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Many play elements are affected by salt movement

for all Mesozoic and Cenozoic petroleum plays in DEFAB

	Shallow gas plays	Chalk play	Lower Cretaceous play	Upper Jurassic plays	Main Buntsandstein Play	Fat Sand play	Zechstein caprock play
Source and charge	Controls location of charge, source rock burial/ Accelerates biogenic gas generation	Controls source rock burial and affects HC migration path	Controls source rock burial/ Charge through salt windows	Controls source rock burial/ Charge through salt windows	Charge occurs through salt windows	Charge through salt windows	Controls source rock burial/ Charge through salt windows
Trap and seal	Structural traps commonly above salt structures	Forms structural traps, affects intra-reservoir traps. Risk of breaking seal by vertical movement.	Forms structural trap	Forms structural trap	Forms structural traps, seals reservoirs (side, top seal, salt plugging)	Potential top/side-seals, potentially 3-way dip closure traps against salt structure	Forms structural trap
Reservoir	-	Controls reservoir facies, intra-reservoir boundaries, and reservoir fracturing	Possibly controls sand (re-) distribution	Controls reservoir sand facies distributions	-	Triassic 'fat sand' deposition is accommodated by salt withdrawal	Controls timing of reservoir rock formation;

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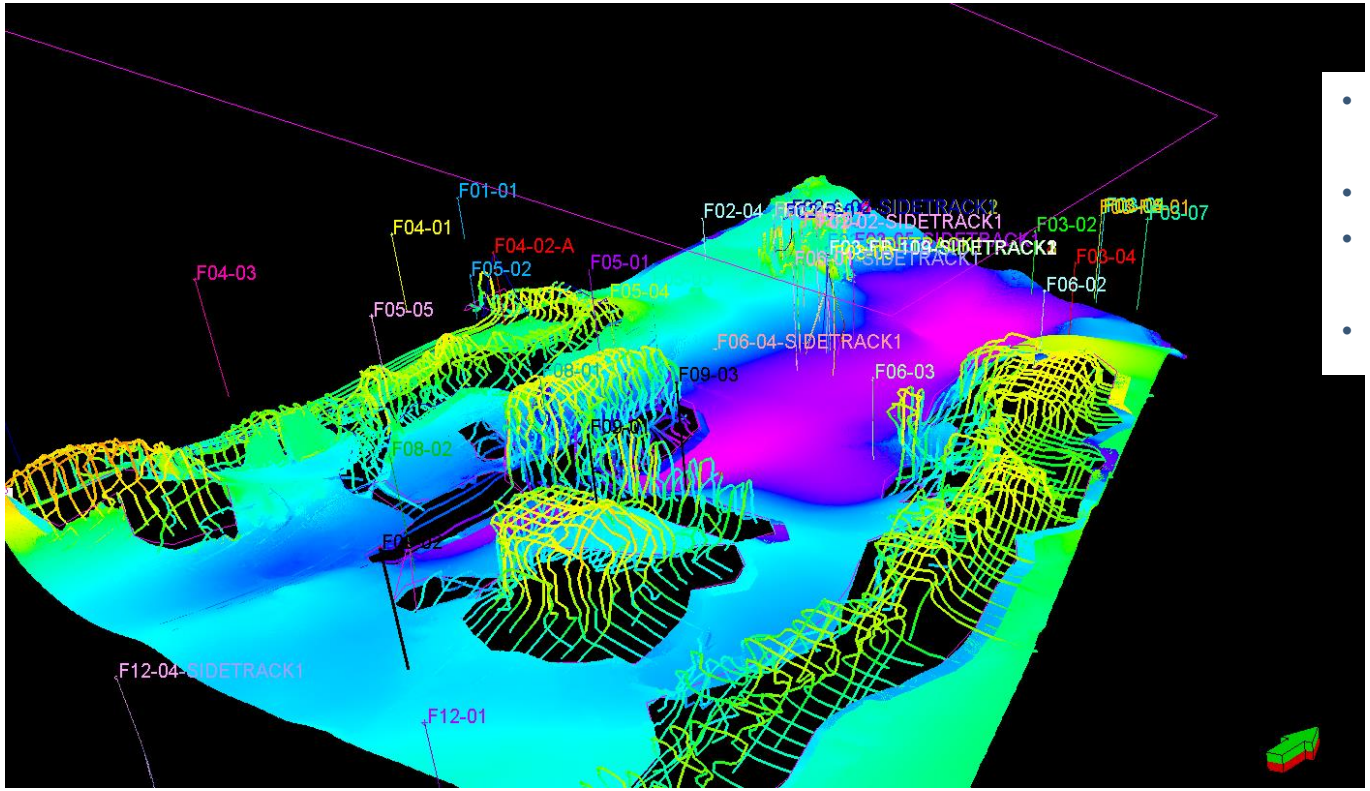
Structural restoration in 3D

to understand post-Cretaceous deformation and explain HC migration



- 3D restoration blocks F5, F6, F8, F9
- Restoration till E-Cretaceous,
- analyse many input parameters
- Results tested against wells & leads

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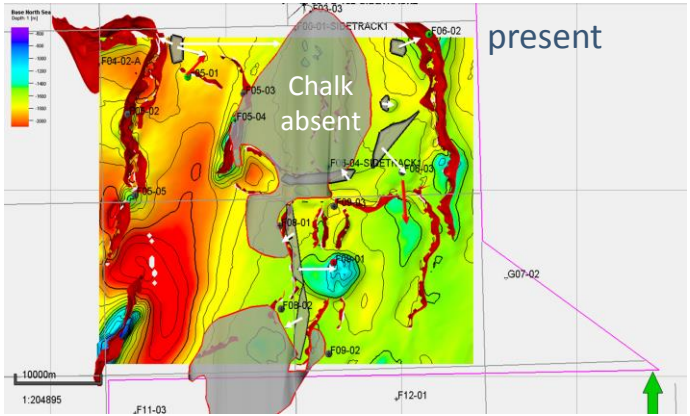
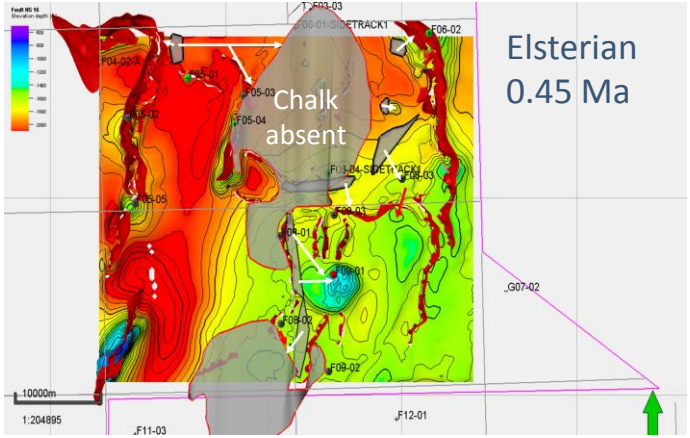
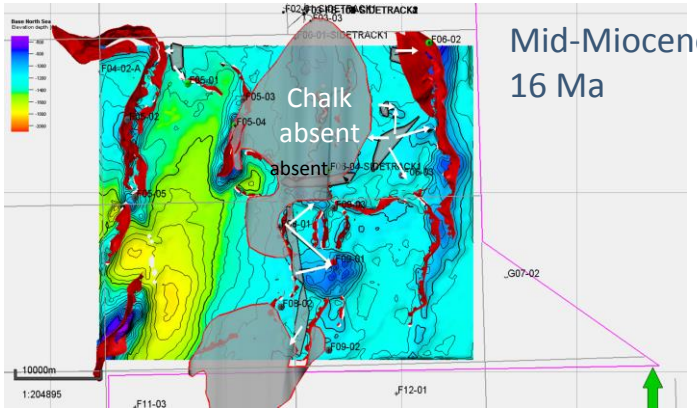
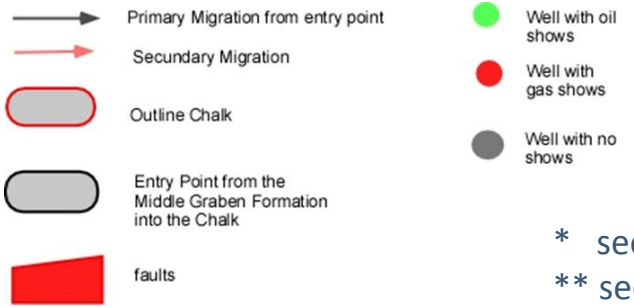
Top Danian at various time steps

changes in dip may change HC migration path









input parameters assessed:

- thickness and timing of ice sheets
- (de-)compaction of overburden strata*
- paleo-topography and water depth
- Eridanos delta**

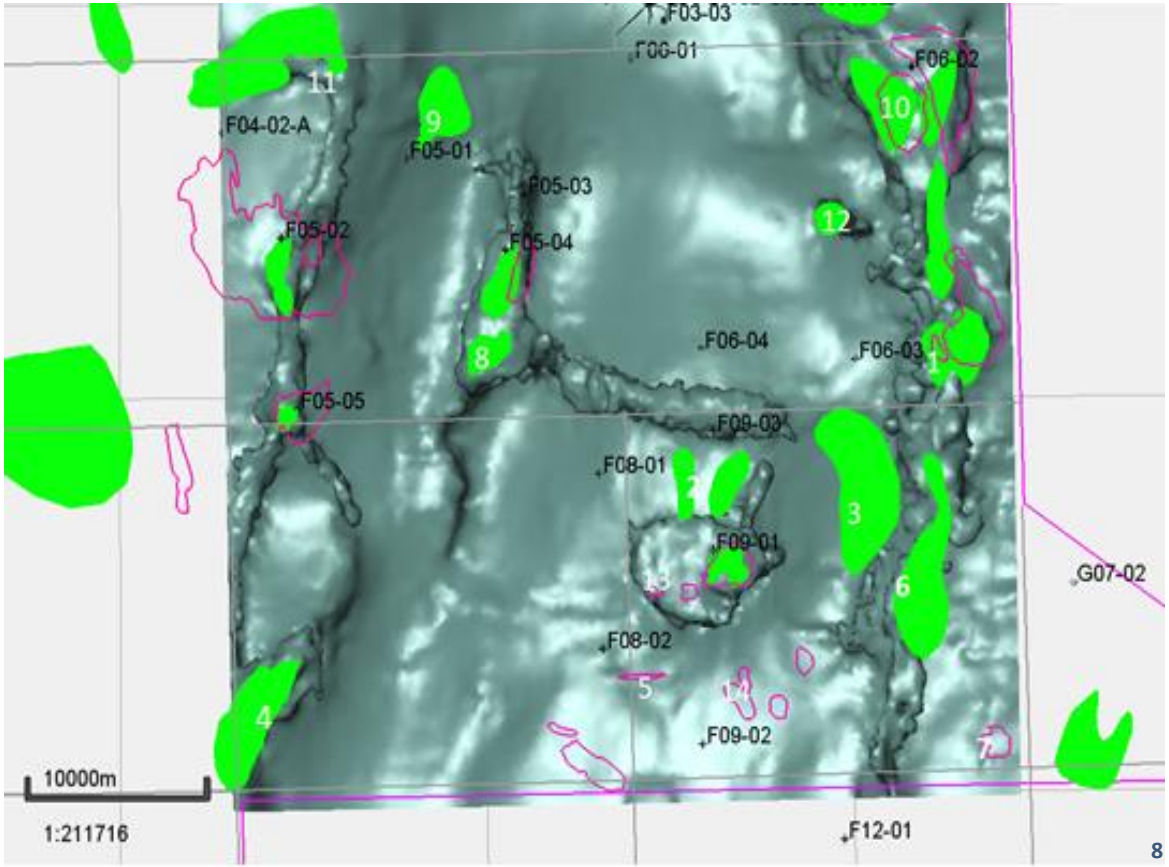
* see also poster 9

** see also poster 16

Modeling results tested against wells & EBN leads

at Chalk level

- EBN Chalk leads based on structural closure shown on map (green polygons), see poster 15 as well.
- Well results explained fairly well (10 out of 13 wells)
- Support prospect evaluation
- Leads and released wells will be discussed in the report



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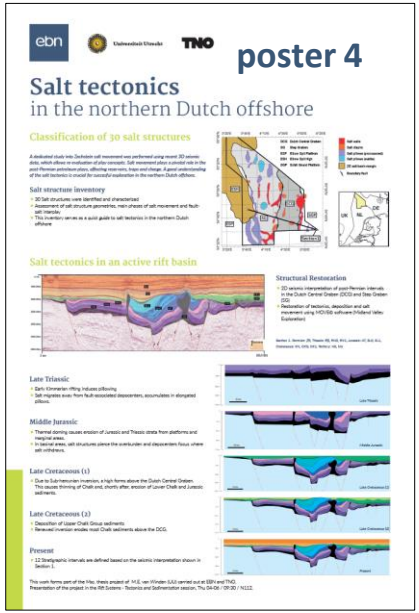

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