

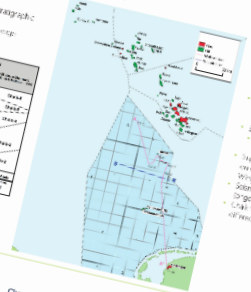
Chalk Studies

A proven yet underexplored play

- Oil production since 1988: 92 billion m³ of oil
- Reserves: 117 billion m³
- Many deep-sea reservoirs
- Reservoirs: 10-15% of total oil
- 10-15% of total oil
- 10-15% of total oil

Unit	Thickness (m)	Porosity (%)	Permeability (D)	Depth (m)
Chalk	10-15	10-15	10-15	10-15
Chalk	10-15	10-15	10-15	10-15
Chalk	10-15	10-15	10-15	10-15
Chalk	10-15	10-15	10-15	10-15
Chalk	10-15	10-15	10-15	10-15
Chalk	10-15	10-15	10-15	10-15
Chalk	10-15	10-15	10-15	10-15
Chalk	10-15	10-15	10-15	10-15
Chalk	10-15	10-15	10-15	10-15
Chalk	10-15	10-15	10-15	10-15

Chalk fields

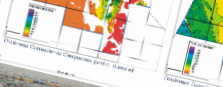
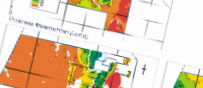
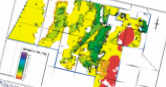


Studies/ research initiatives

- Developing and testing the chalk unit and associated reservoir
- Geological evaluation of the chalk unit in the offshore
- Geological evaluation of the chalk unit in the onshore
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Preliminary results

Thickness stratigraphic units



Chromostratigraphic units



Chromostratigraphic units

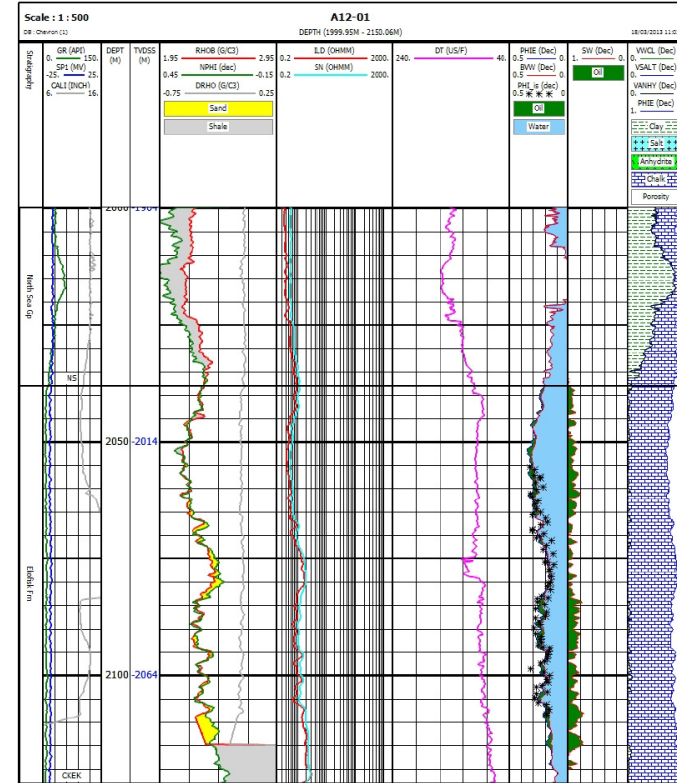
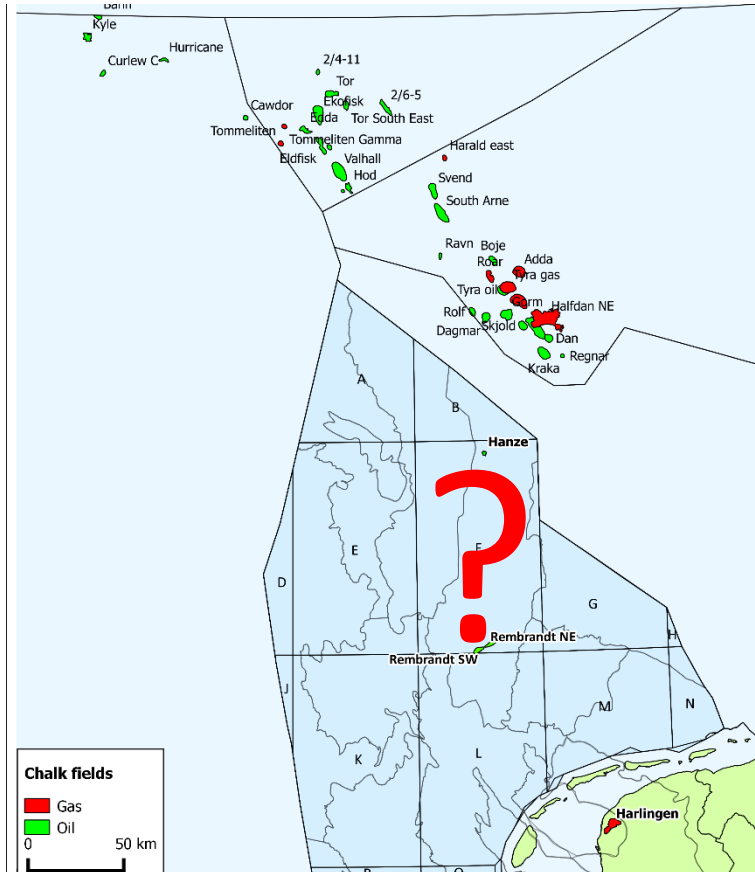


Exploration day

Nora Heijnen

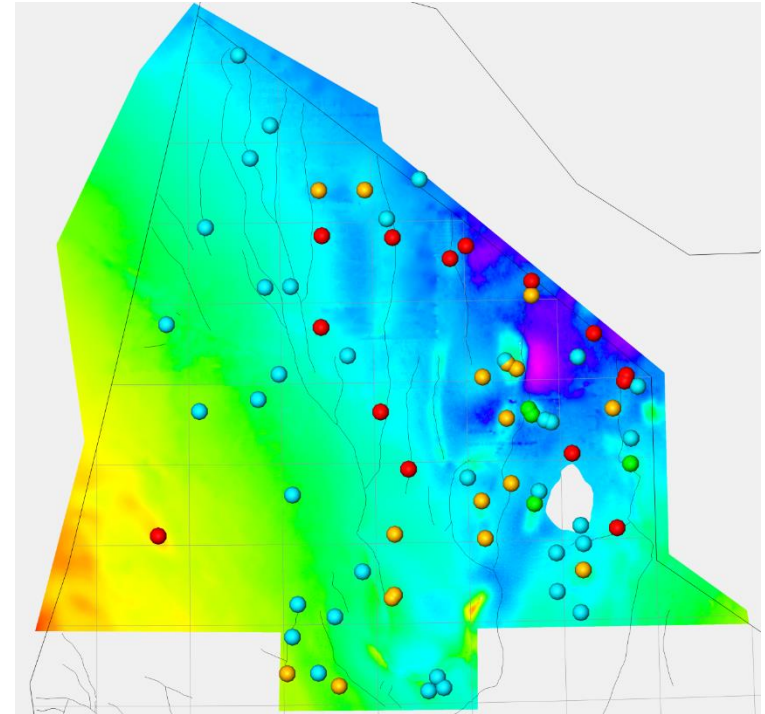
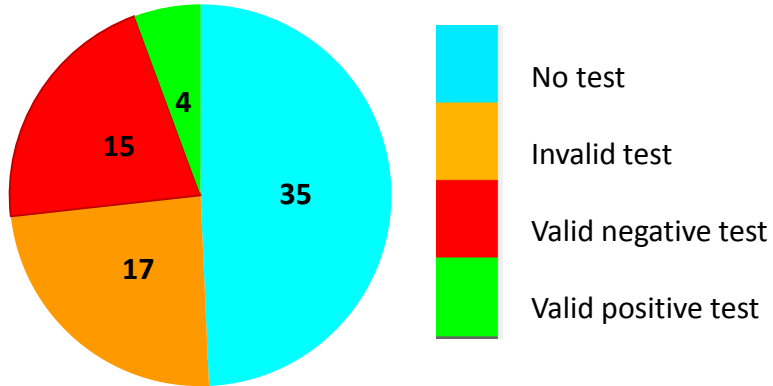
Poster 9: Chalk studies

Chalk fields in the Dutch northern offshore



Post mortem analysis

71 wells evaluated, only 25% considered valid test for the Chalk



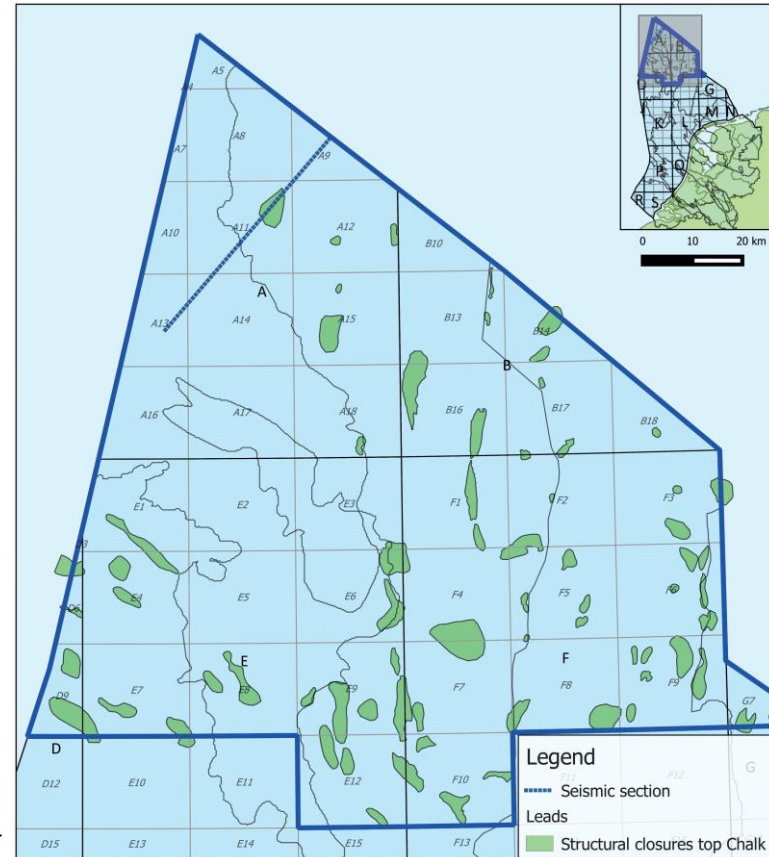
Presented at EAGE 2014

Chalk leads

>55 untested closures of which >30 in open acreage

STOIIP 10-300 MMbbls each

Possible intra-Chalk structural or stratigraphical traps



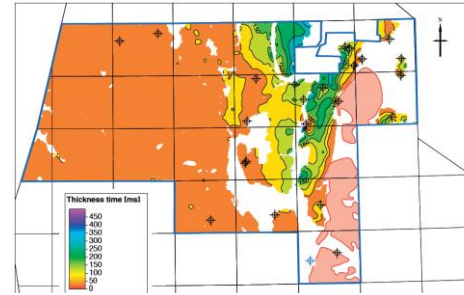
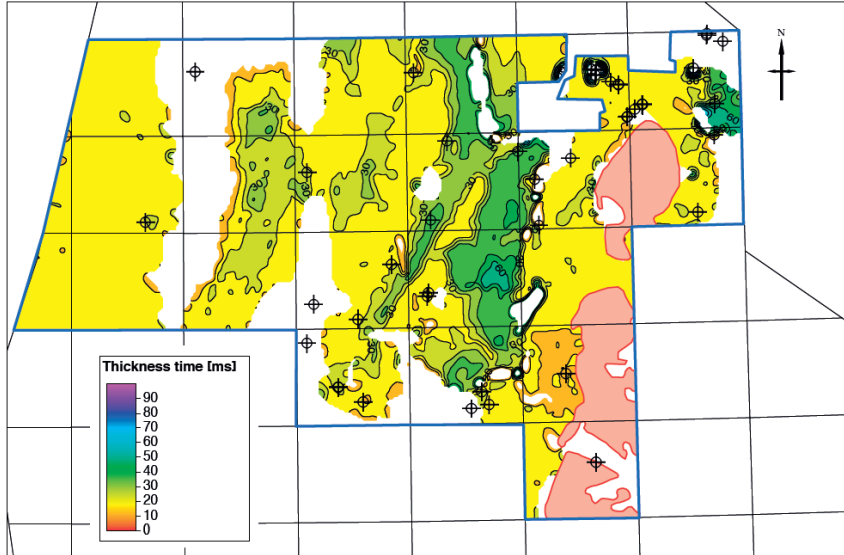
Presented at EAGE 2014

- Identifying and mapping intra-chalk units and unconformities (Van de Voet, 2015)
- *Reconstructing halokinetic development of salt structures (Van Winden, 2015) (poster 6)*
- *3D reconstruction – predicting chalk prospects in Chalk (van Straaten, 2016) (poster 6)*
- Hydrocarbon show database (Heerema, 2016, ongoing)
- Improved Chalk Group facies and velocity modelling based on well log correlation, Dutch North Sea Basin (ongoing, Van Wingerden)
- Seismic geomorphology of the Chalk in the Netherlands (ongoing)
- Chalk Formation evaluation: identifying similarities and differences in Dutch Chalk wells (EBN internal)

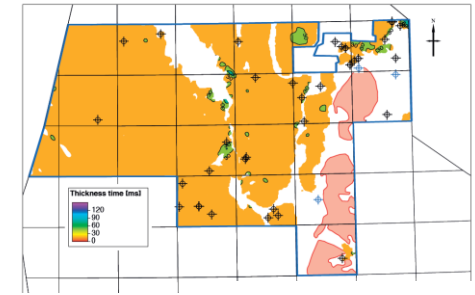


Intra-Chalk units

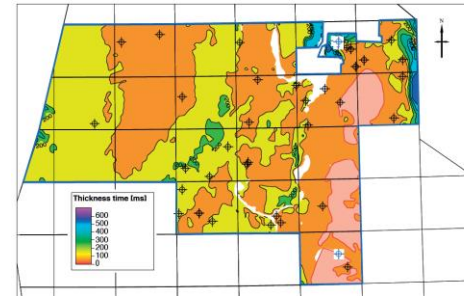
Thickness Danian [ms]



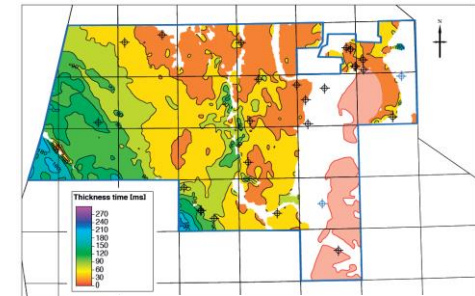
Thickness Coniacian - Campanian [ms]



Thickness Cenomanian [ms]



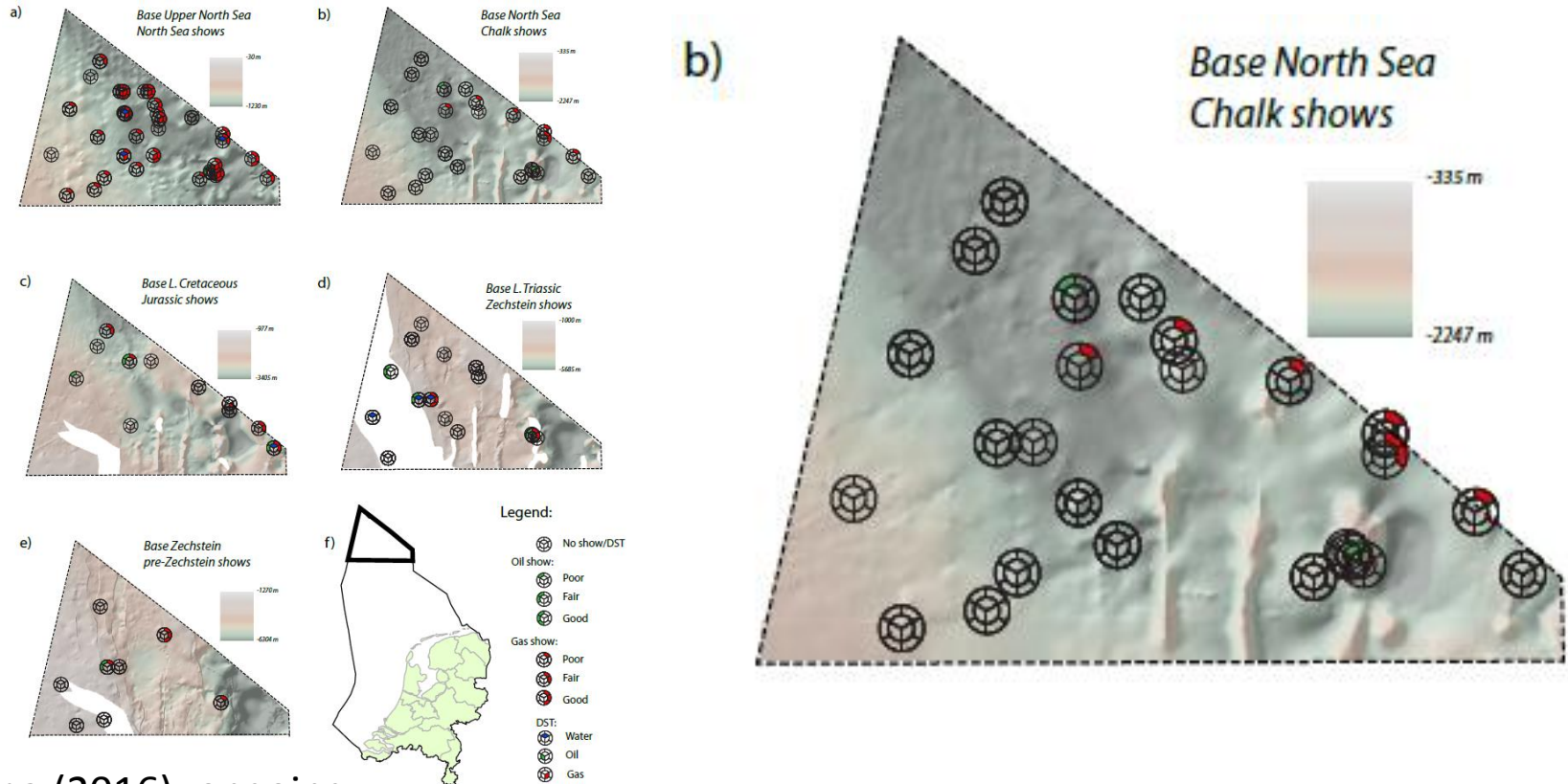
Thickness Maastrichtian [ms]



Thickness Turonian [ms]

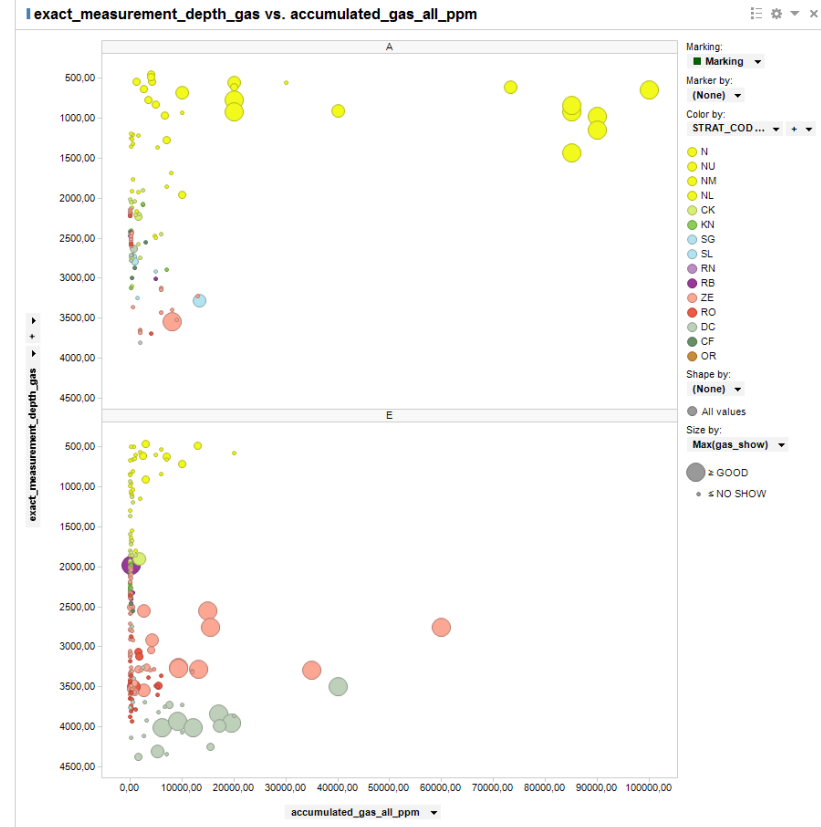
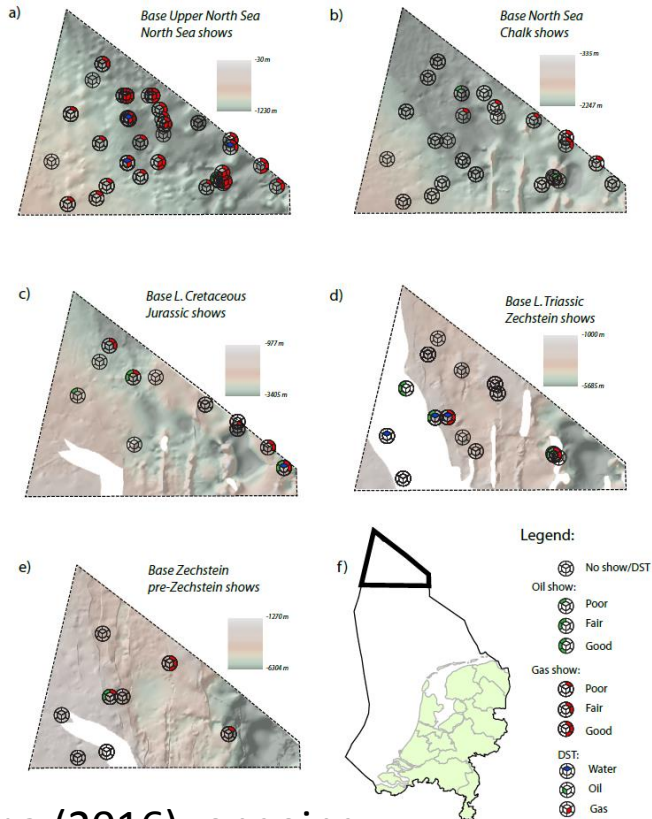
Van de Voet (2015)

Hydrocarbon show database



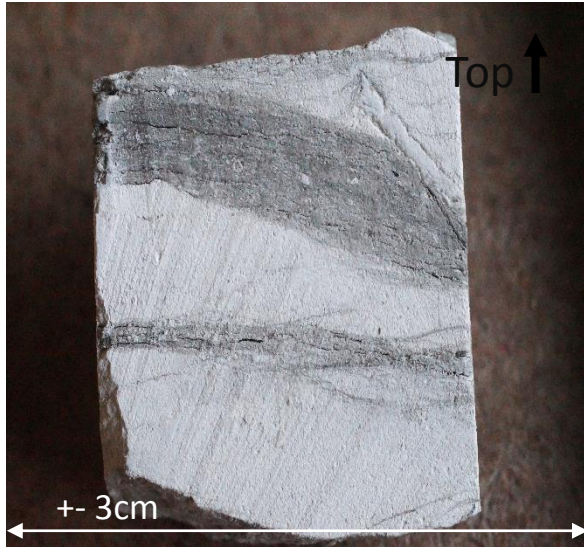
Heerema (2016), ongoing

Hydrocarbon show database

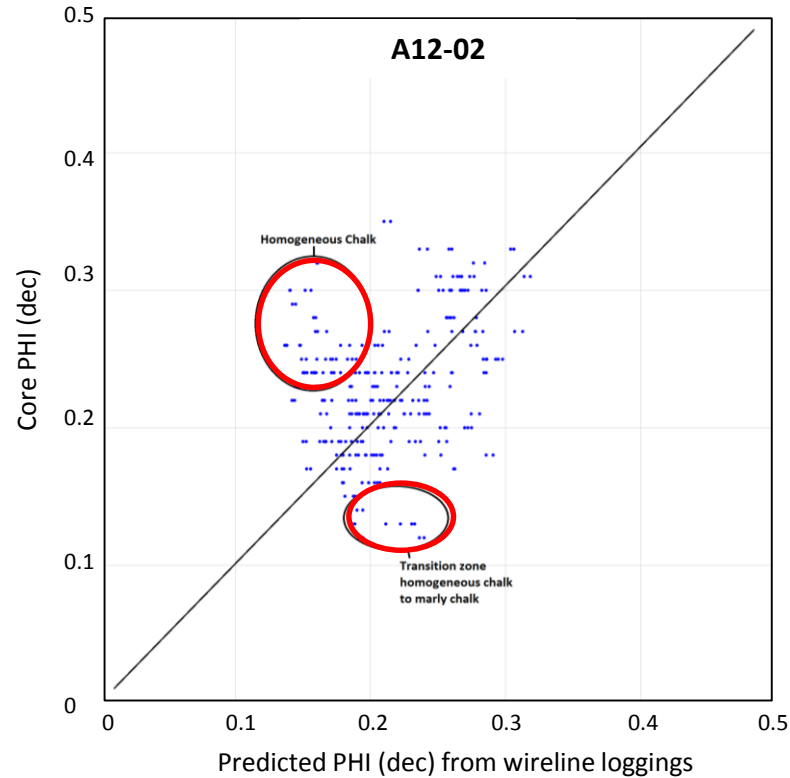


Heerema (2016), ongoing

The role of Chalk Facies

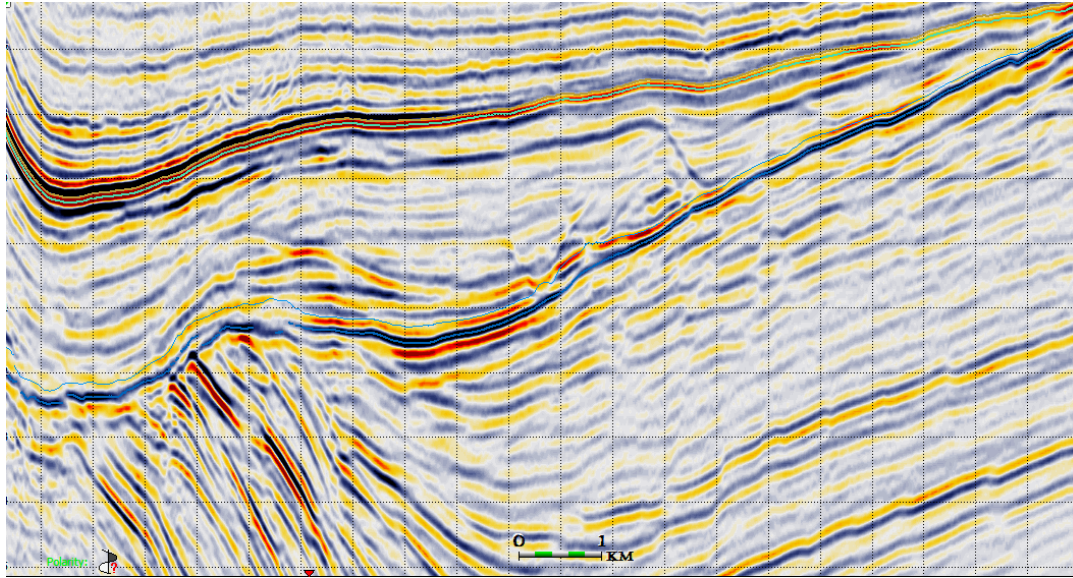


HRL-02, 1078.6 meter

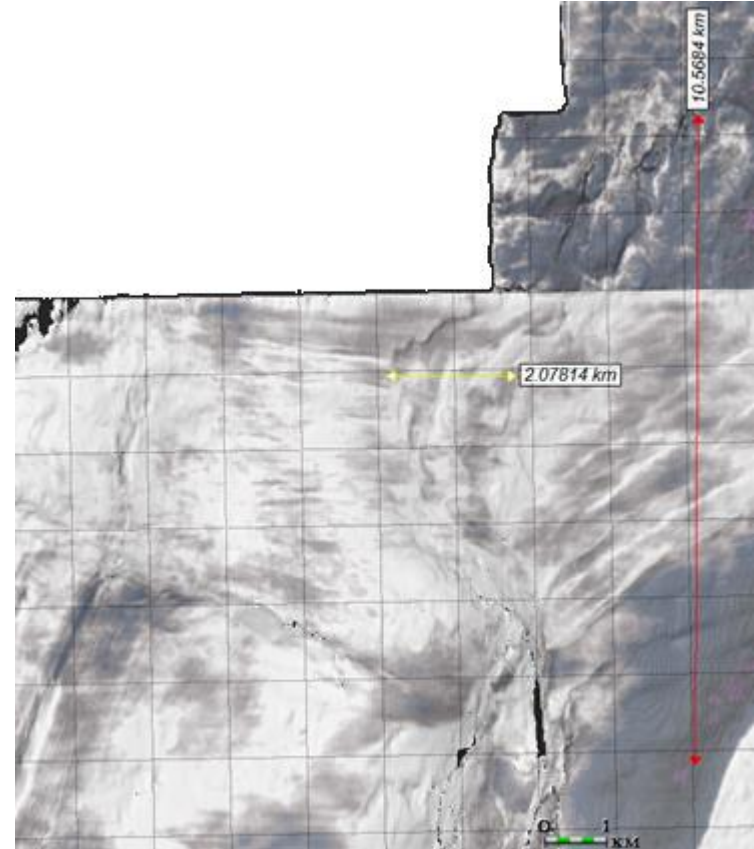


Van Wingerden, ongoing

Chalk geomorphology

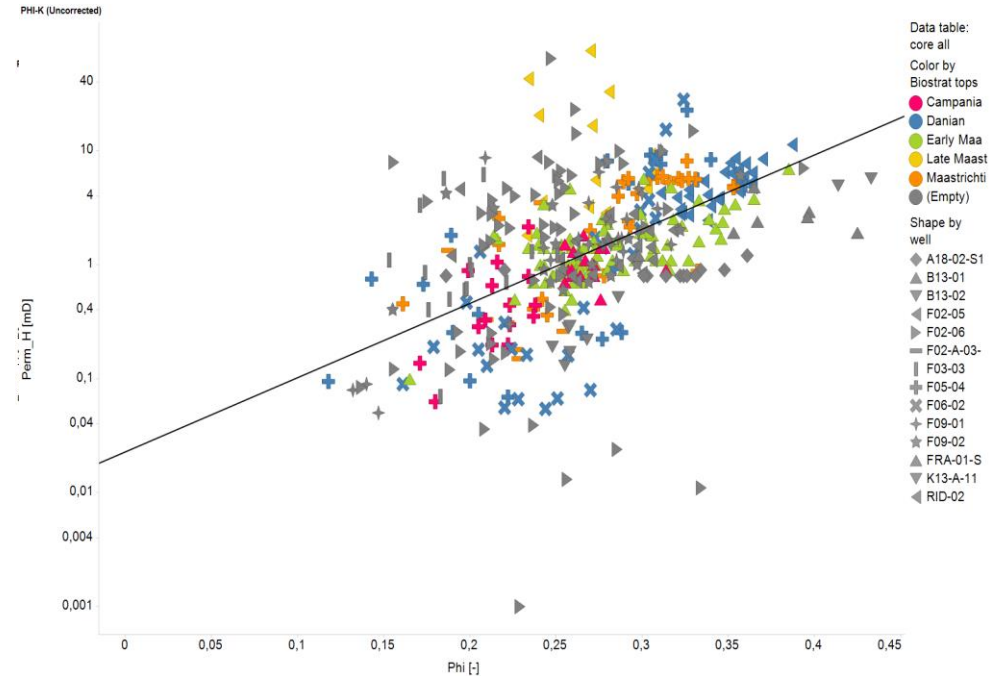


EBN, ongoing



Main data types:

- Well logs
- Well test / PVT data
- Core information (RCA)
- Pressure data
- Biostratigraphic information
- Facies

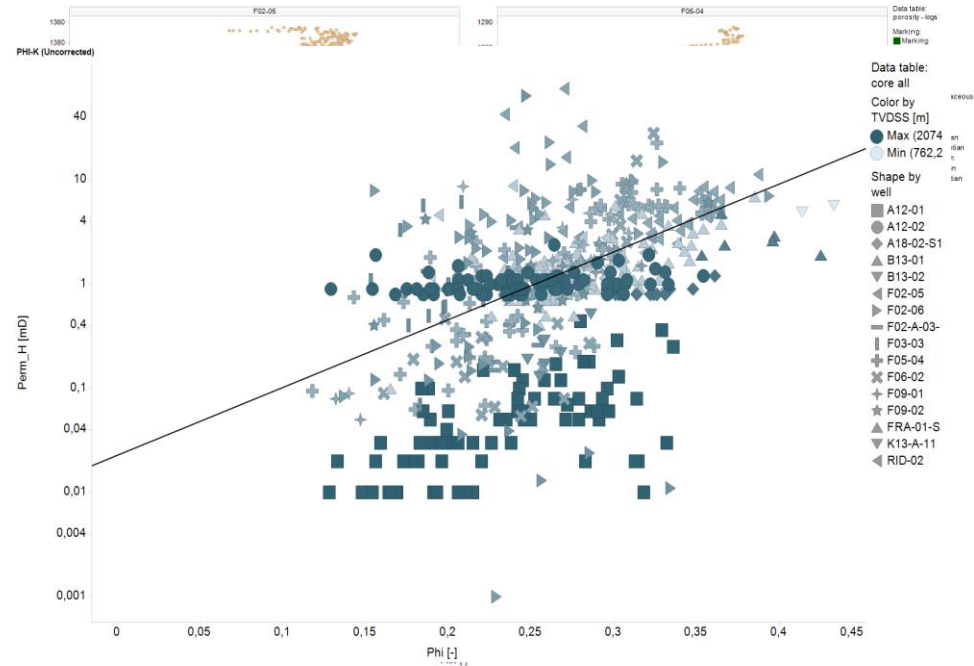


Only public data is presented

EBN, ongoing

Main data types:

- Well logs
- Well test / PVT data
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- Pressure data
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- Facies



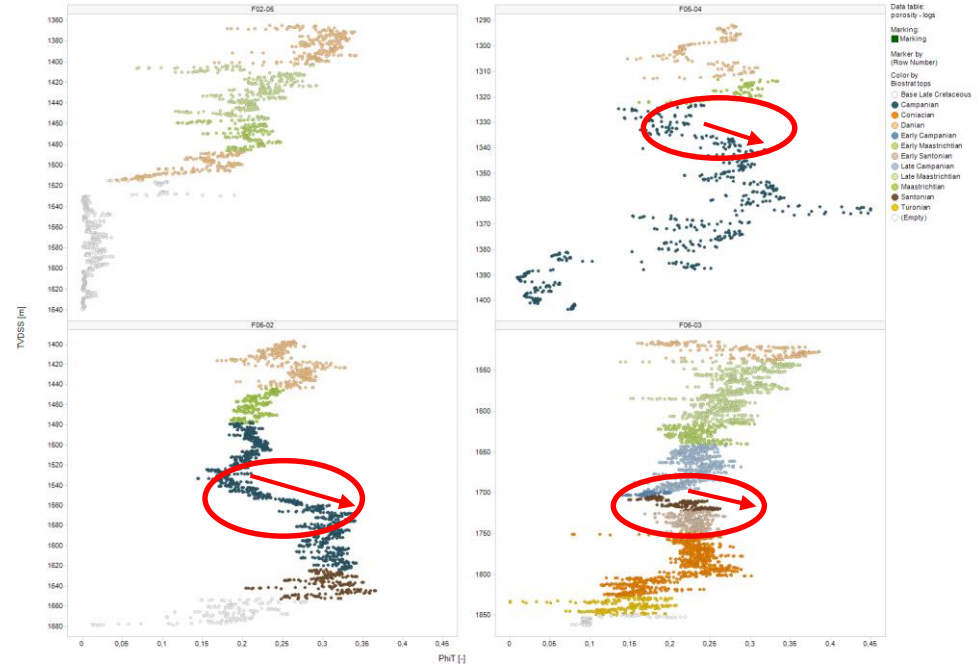
Only public data is presented

EBN, ongoing

Chalk reservoir evaluation

Main data types:

- Well logs
- Well test / PVT data
- Core information (RCA)
- Pressure data
- Biostratigraphic information
- Facies

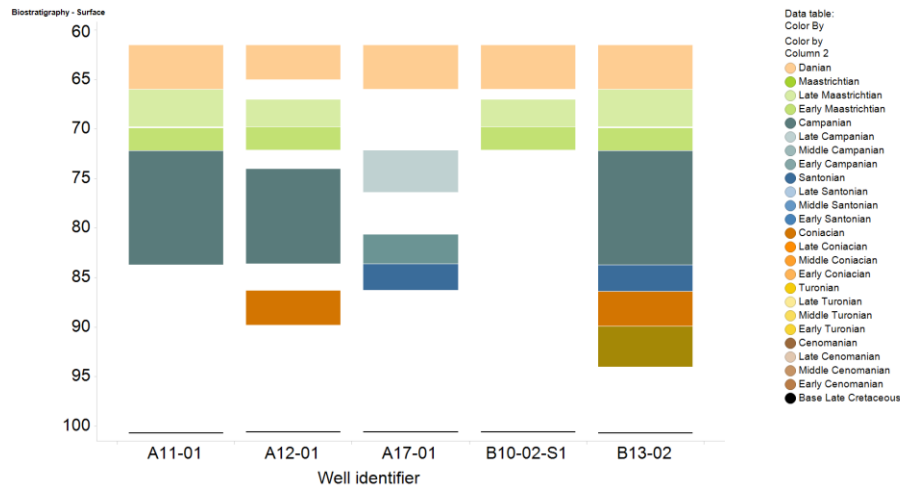


Only public data is presented

EBN, ongoing

Main data types:

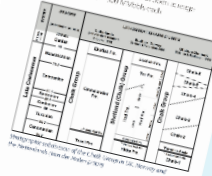
- Well logs
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- Pressure data
- Biostratigraphic information
- Facies



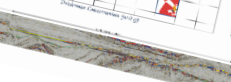
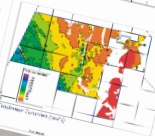
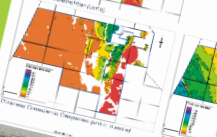
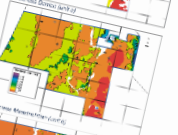
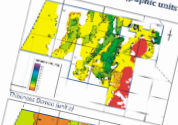
Only public data is presented

EBN, ongoing

- Oil production still underexplored phy
- discovery (17-18)
- Many deep water untapped
- Potential for infra-structural or strategic
- Invest in infrastructure
- > 95 untapped countries, > 30 in deep water
- SEOP from 10-300 barrels each

[illegible]

Van der Vlist (2019)



Chronostratigraphic units
Based on biostratigraphic data and seismic unconformities

