

nordsøfonden



Exploration opportunities in Denmark

Inger Salomonsen, Exploration Manager, Nordsøfonden
FORCE Seminar, 1st November 2018

nordsøfonden

Nordsøfonden - Danish State Company

- Independent state owned company with a Board of Directors
- Partner in all licences awarded since 2005 and partner in DUC with a 20% share
- Same rights and obligations as other companies, paying partner, non-operator
- 19 dedicated professionals make today's Nordsøfonden, located in Copenhagen

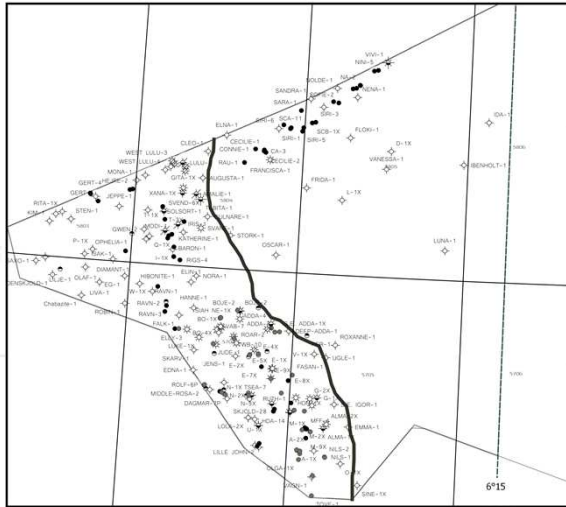
Nordsøfonden - what we do

We strive to increase the value from oil and gas activities in Denmark

- Work as a full circle company - active in exploration, development and production
- Manage the sale of own share of produced oil and gas
- Active during execution of technical work programs and evaluations in the licences
- Wide expertise in legal and financial matters in relation to the business

Data - in a mature basin?

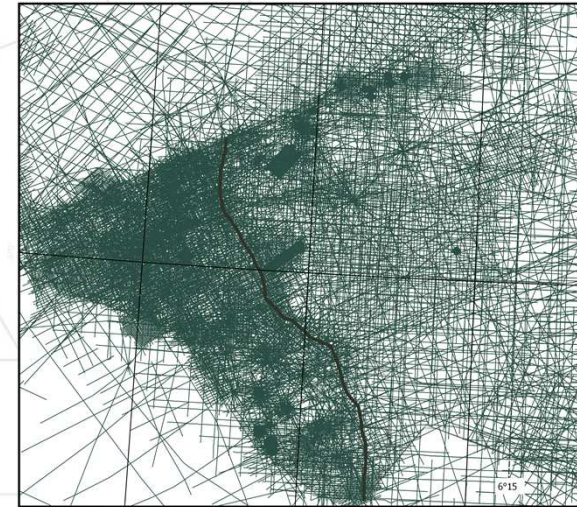
More than
250 deep wells W of 6° 15'



3D seismic coverage



2D seismic coverage



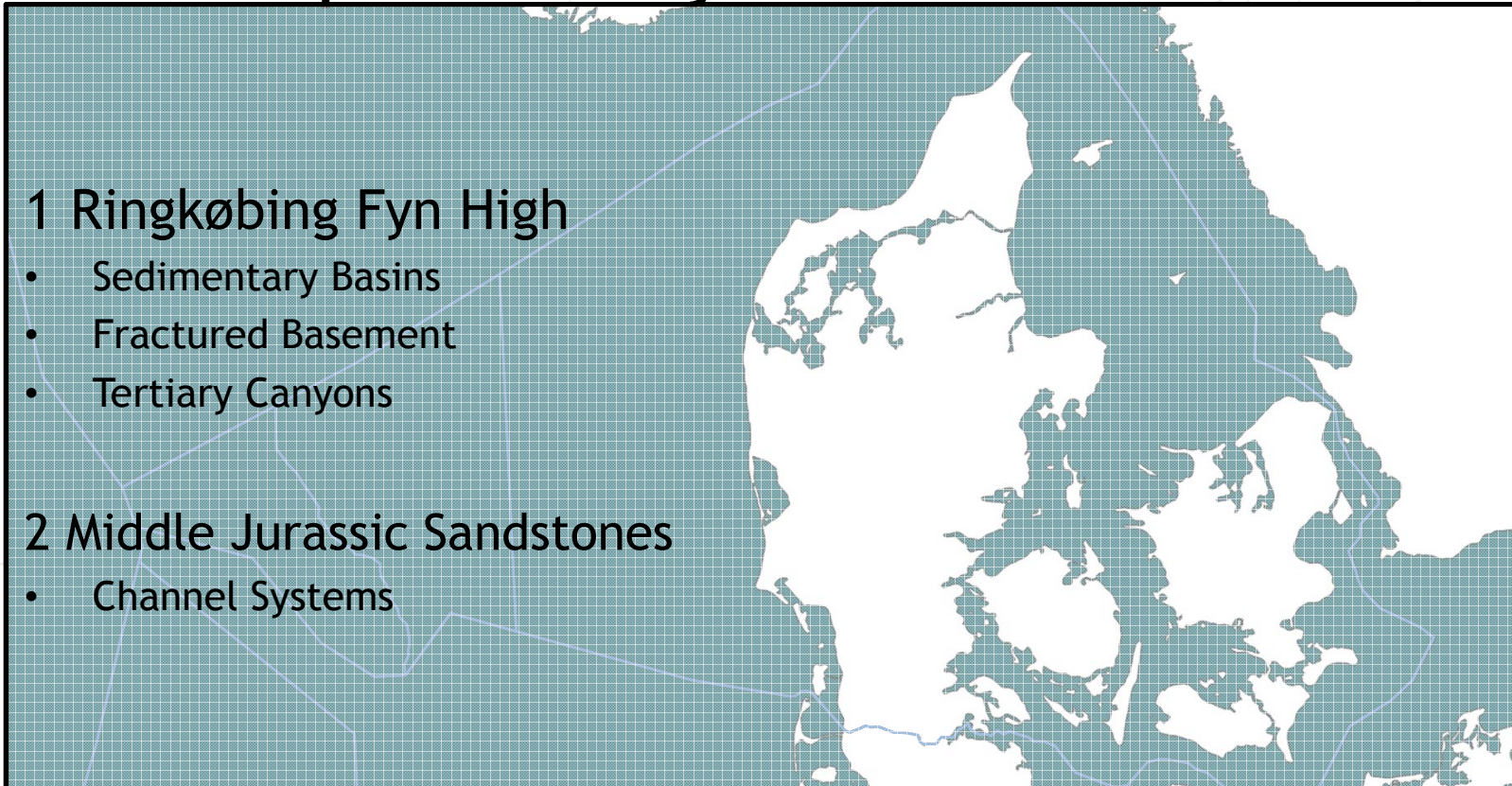
Underexplored Plays

1 Ringkøbing Fyn High

- Sedimentary Basins
- Fractured Basement
- Tertiary Canyons

2 Middle Jurassic Sandstones

- Channel Systems



Underexplored Plays

1 Ringkøbing Fyn High

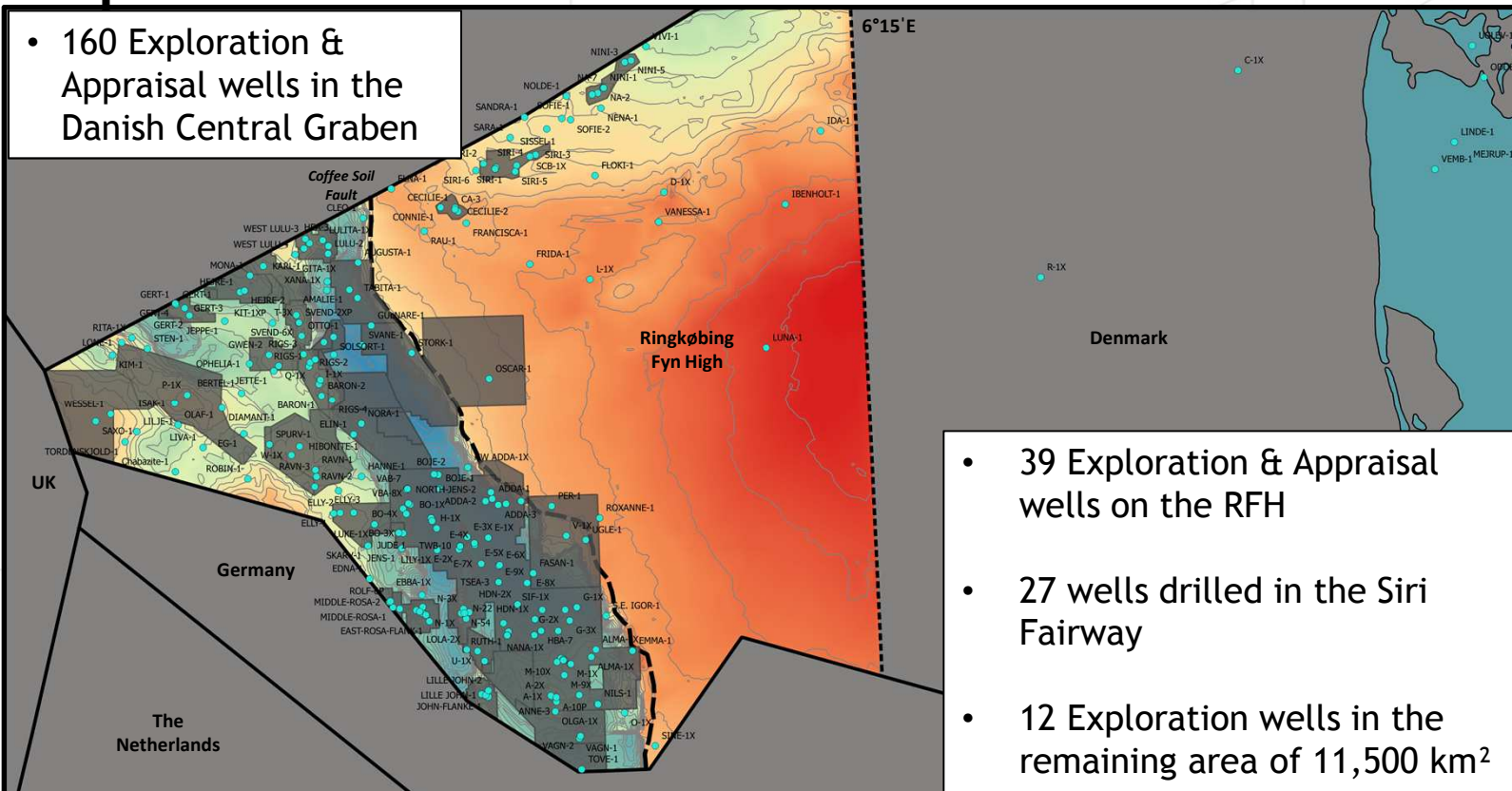
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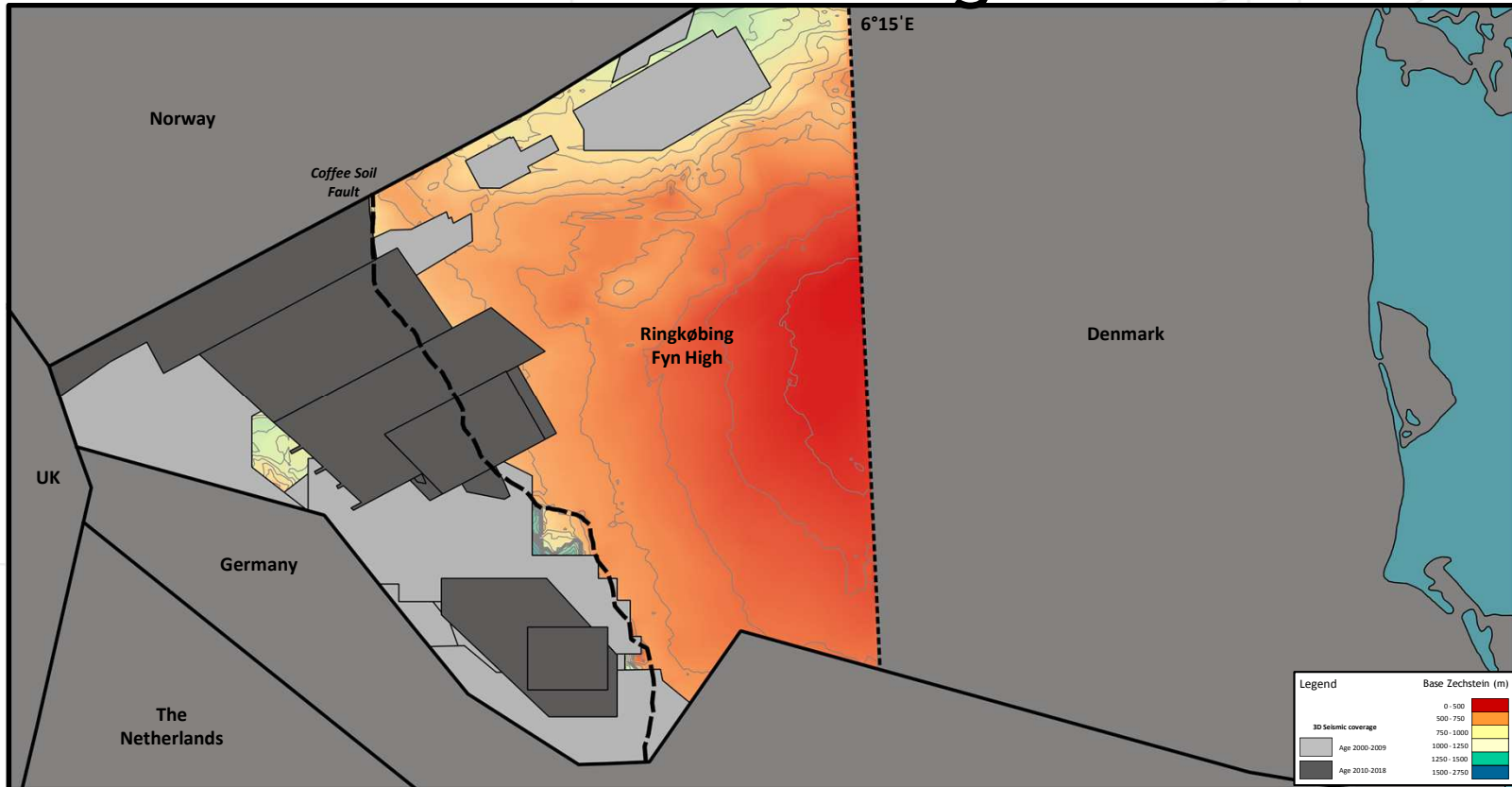
- Channel Systems



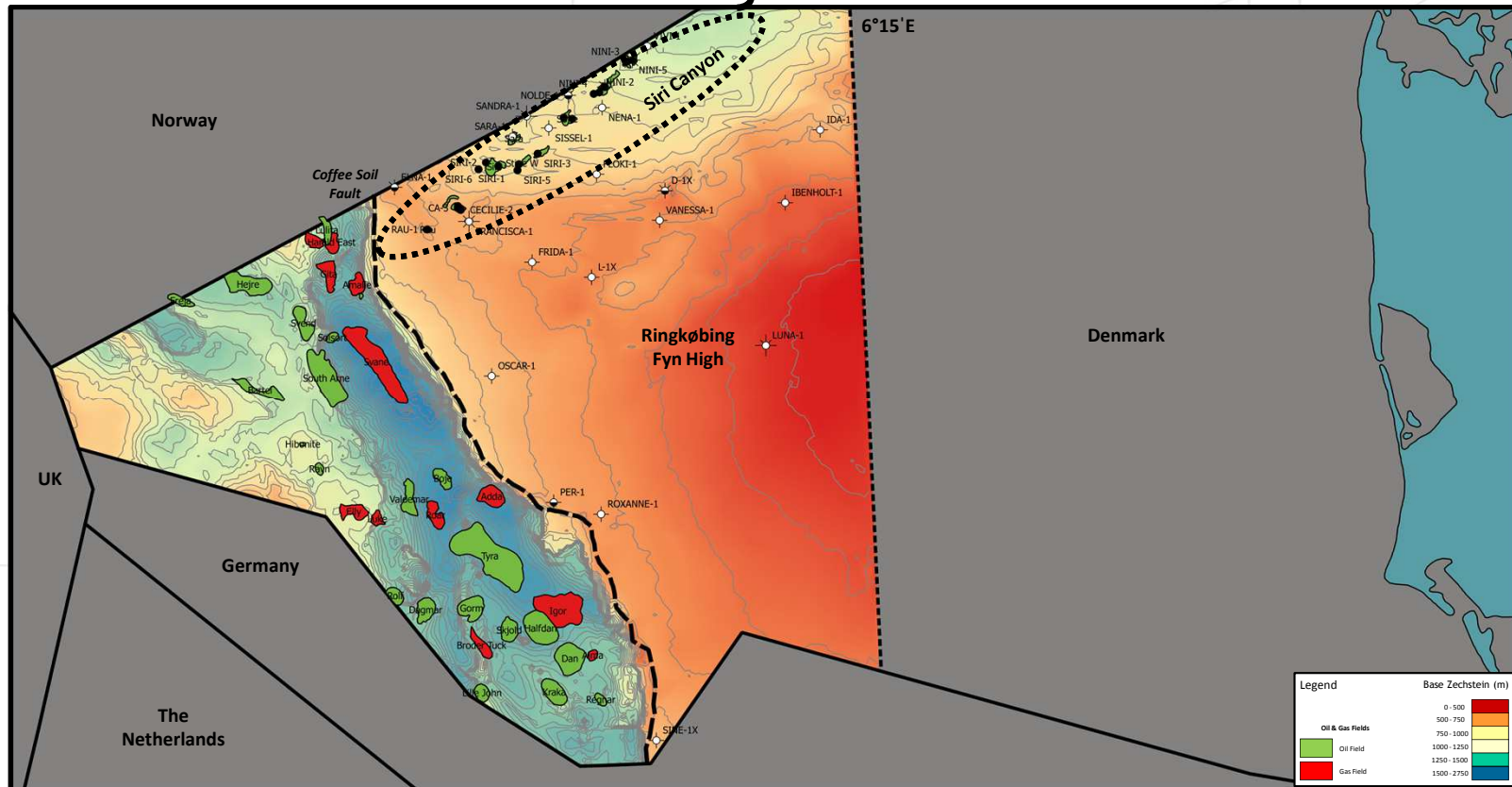
Exploration wells in Denmark 1966-2018



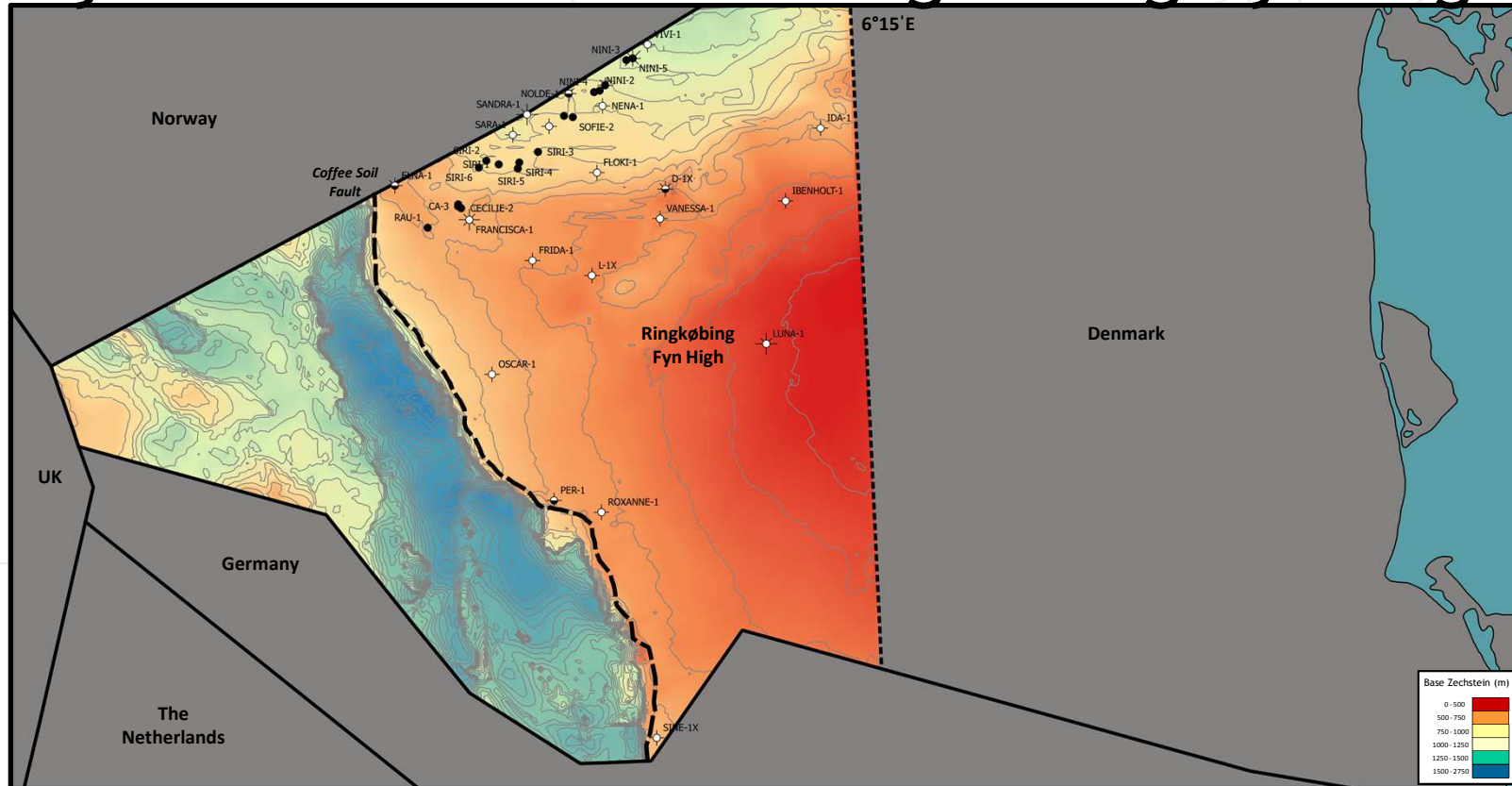
Modern 3D seismic coverage



Prolific Petroleum System

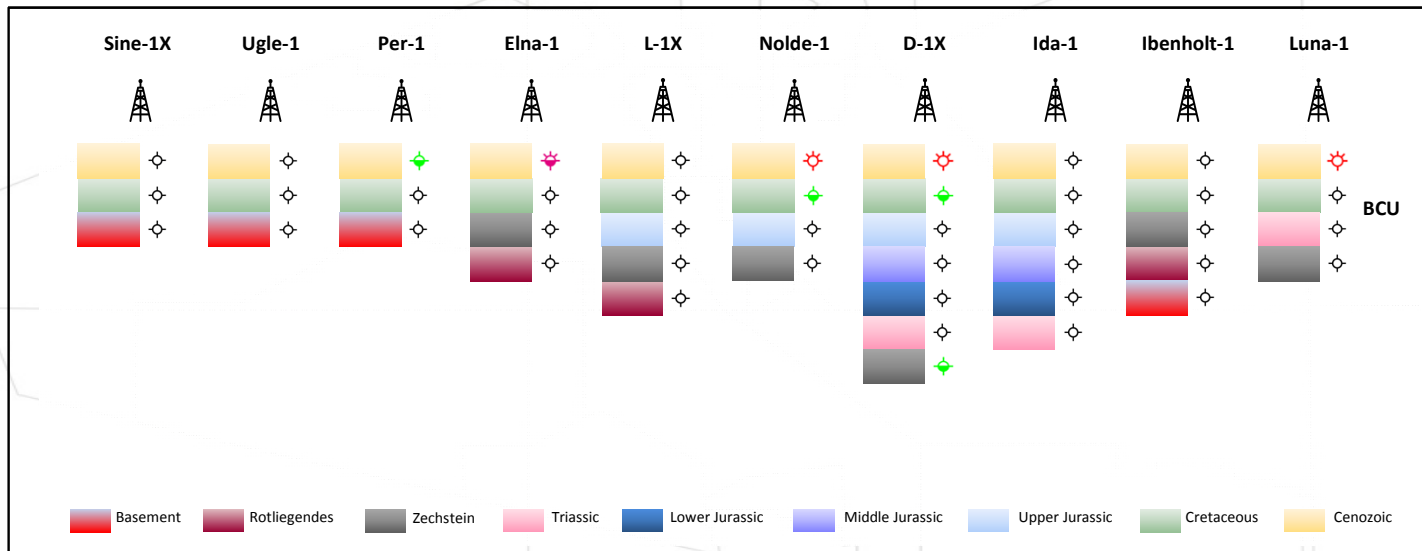
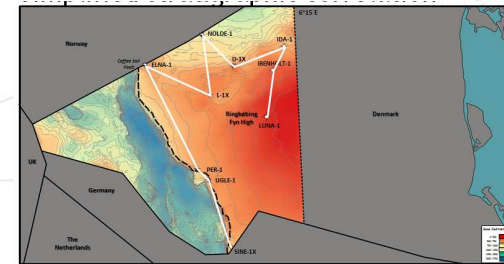


Hydrocarbons on the Ringkøbing Fyn High

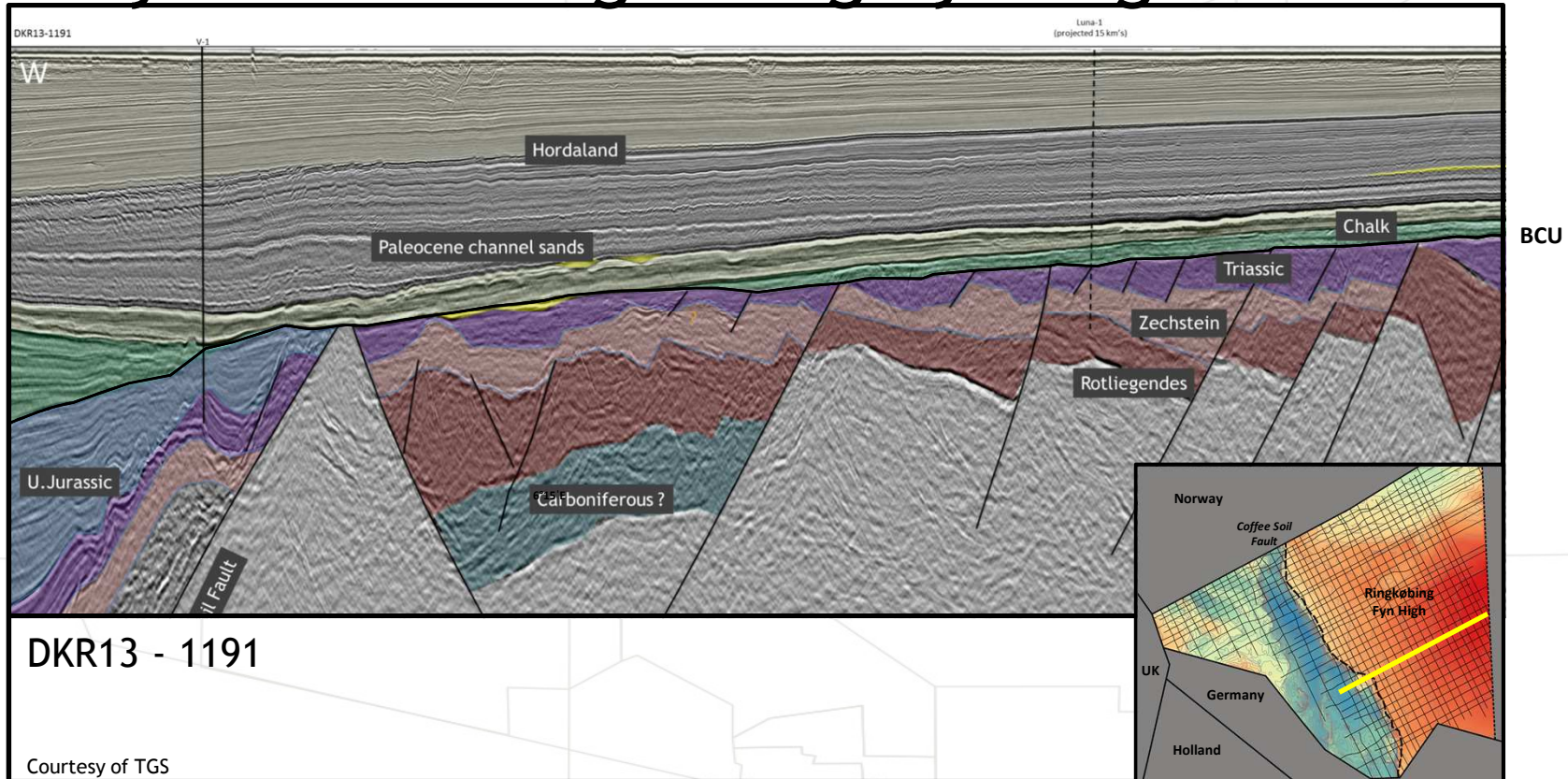


Simplified stratigraphic correlation

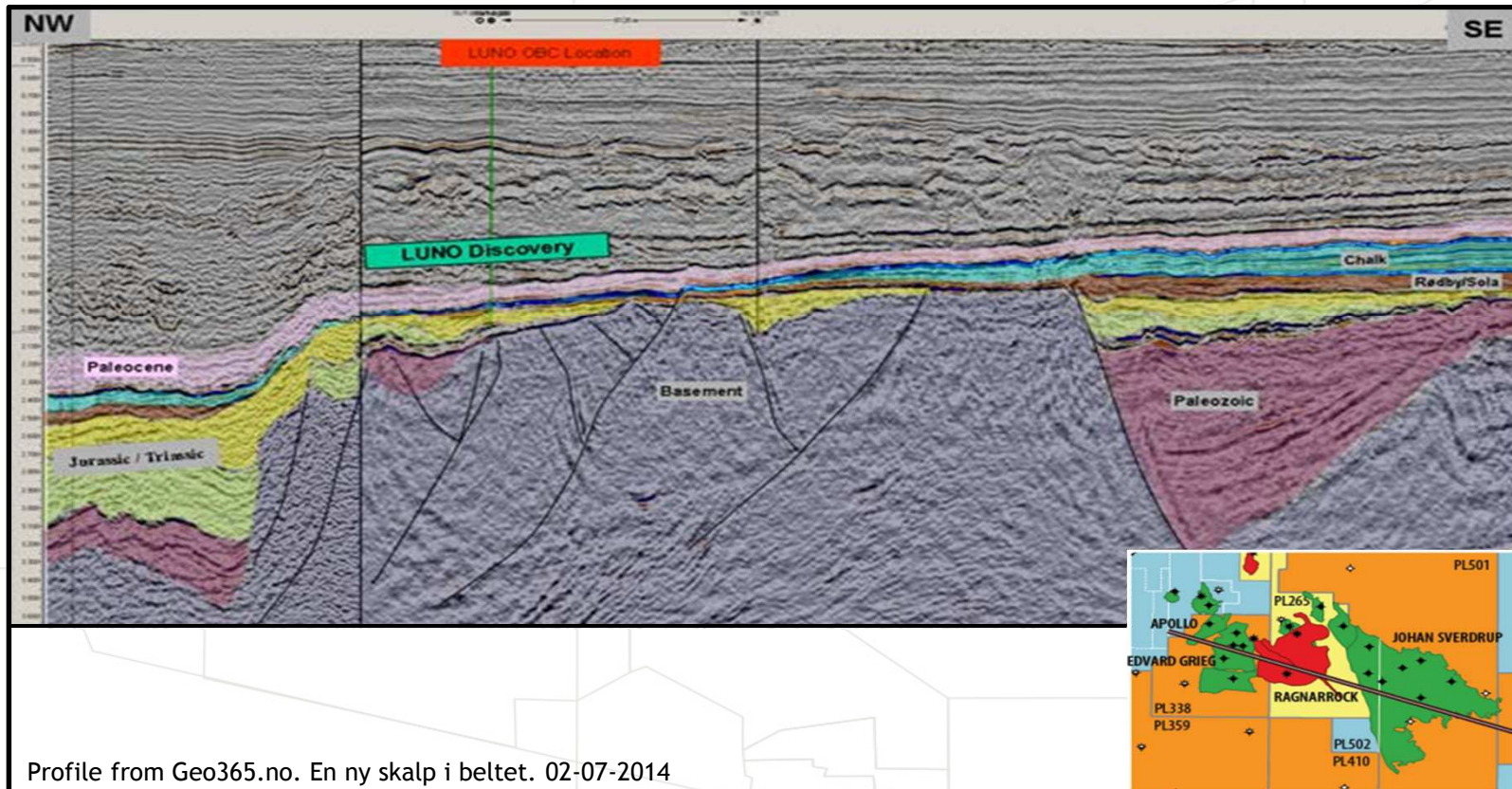
- Sandstones known as reservoir in Central Graben are seen in wells on RFH



Plays on the Ringkøbing Fyn High



Seismic profile across the Utsira High



Profile from Geo365.no. En ny skalp i beltet. 02-07-2014

Basement wells on RFH

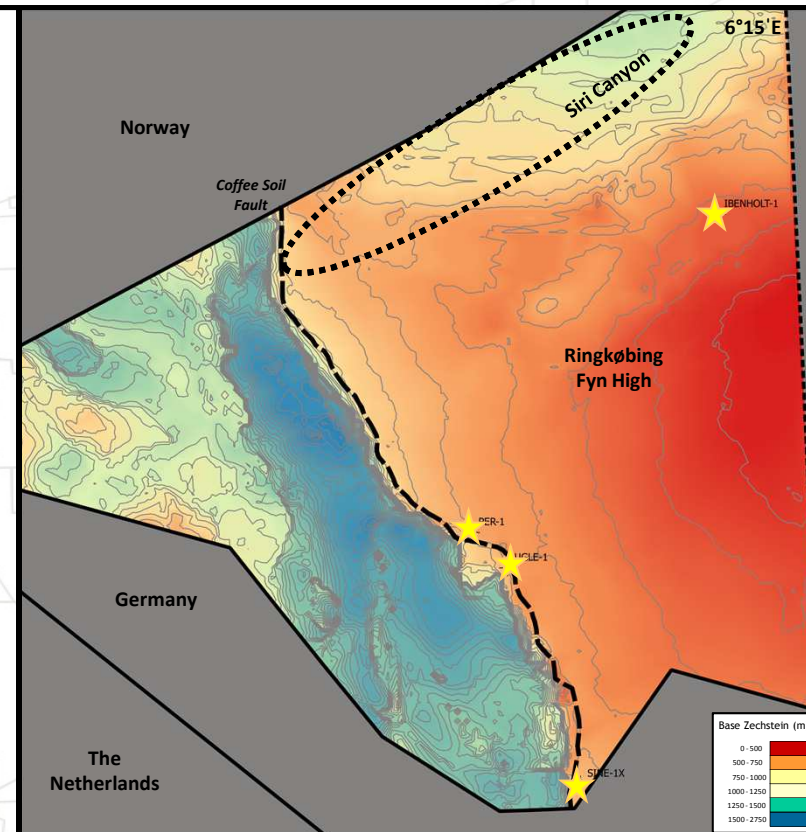
The 4 wells on the Ringkøbing Fyn High all found highly fractured basement

Per-1 (Chevron, 1978) discovered strongly fractured basement at TD of 2781m (9123'). At TD the crystalline rock was dated as Precambrian

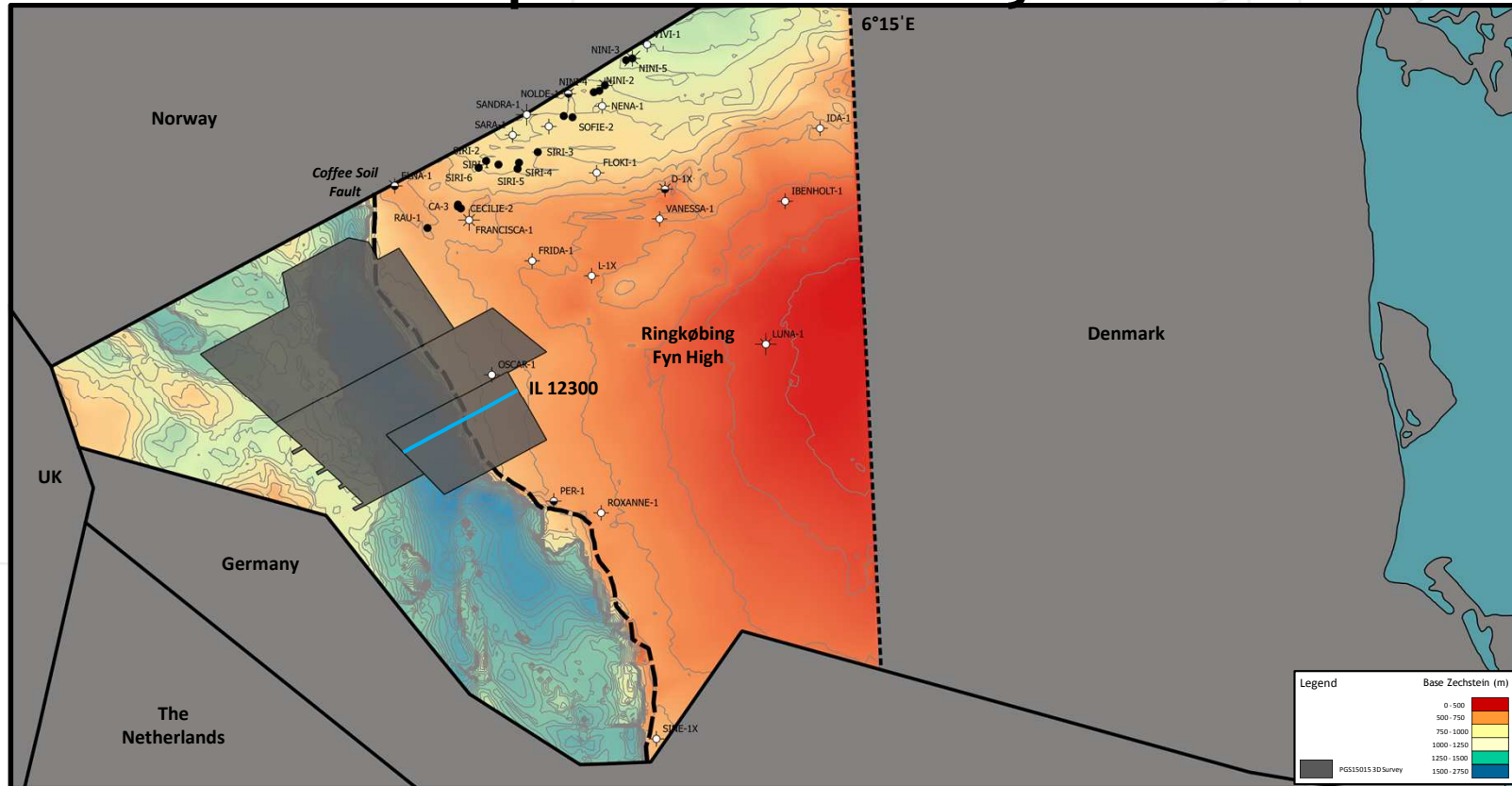
Ugle-1 (BP, 1985) discovered densely fractured and calcite veined metamorphic basement at TD of 3057m (10029')

Sine-1x (Mærsk, 1998) discovered fractured gneiss at TD of 2840m (9318')

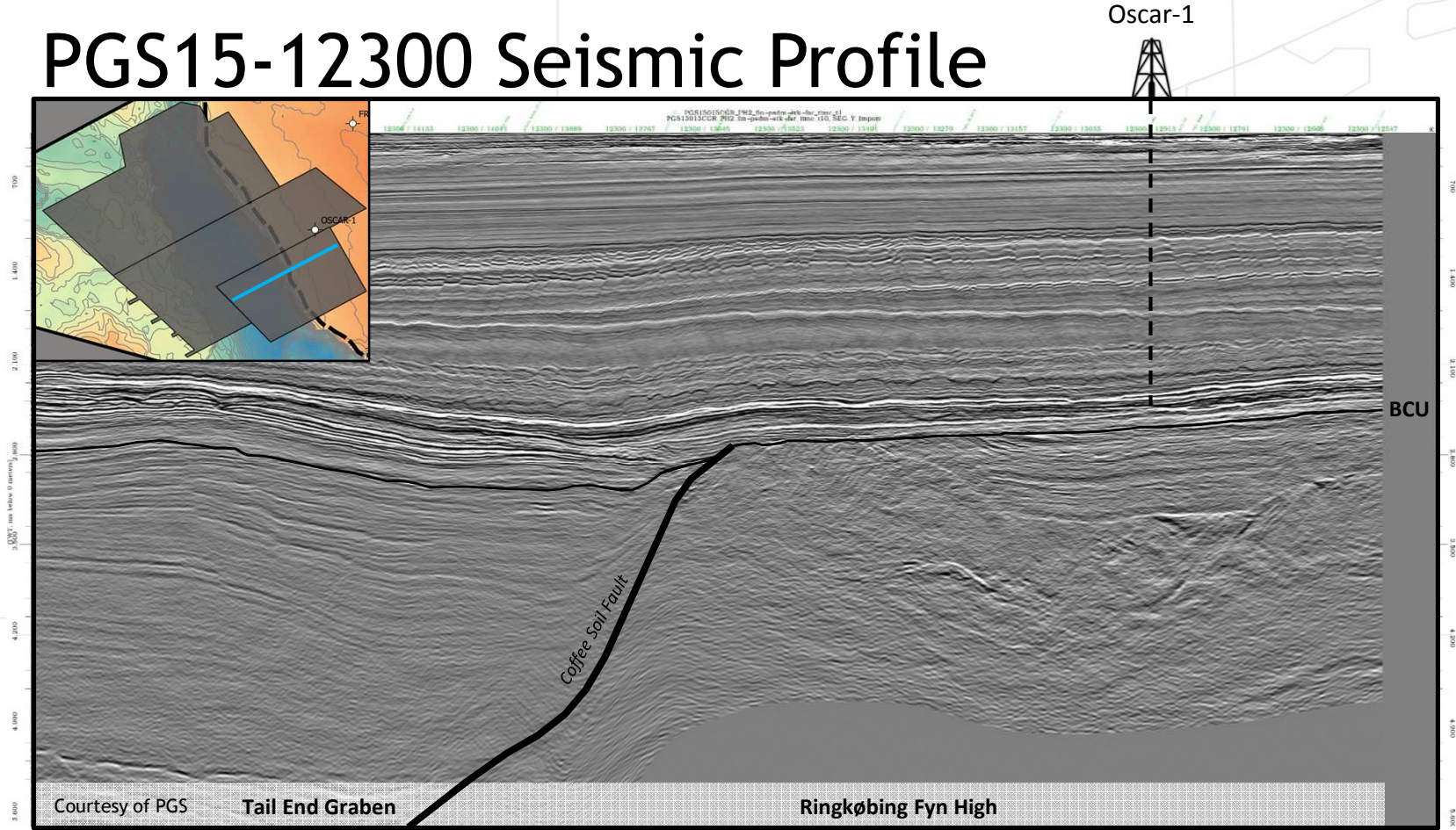
Ibenholt-1 (Phillips, 1987) discovered fractured granitic gneiss at TD of 2530m (8300')



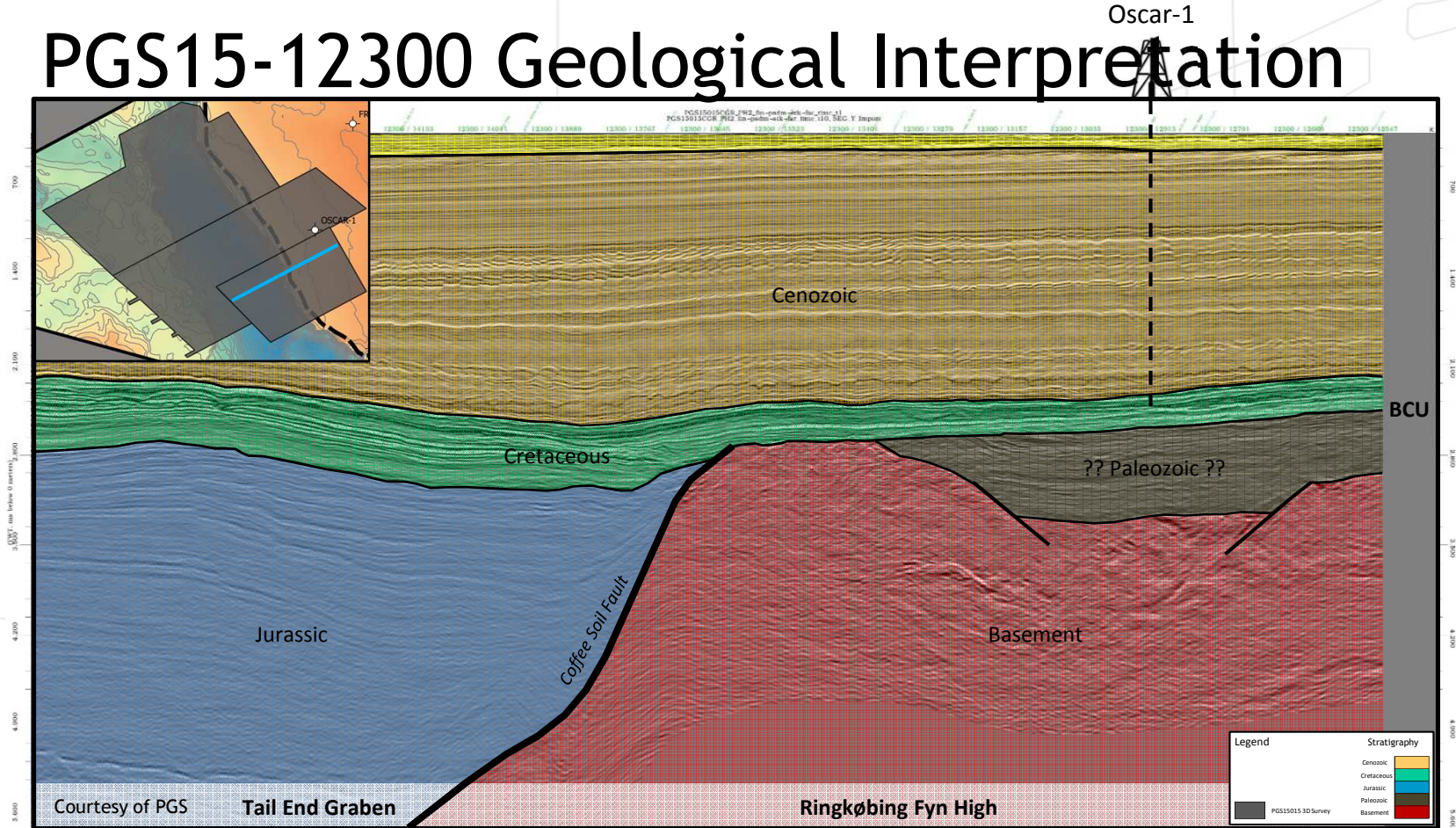
Seismic example - 3D survey on RFH



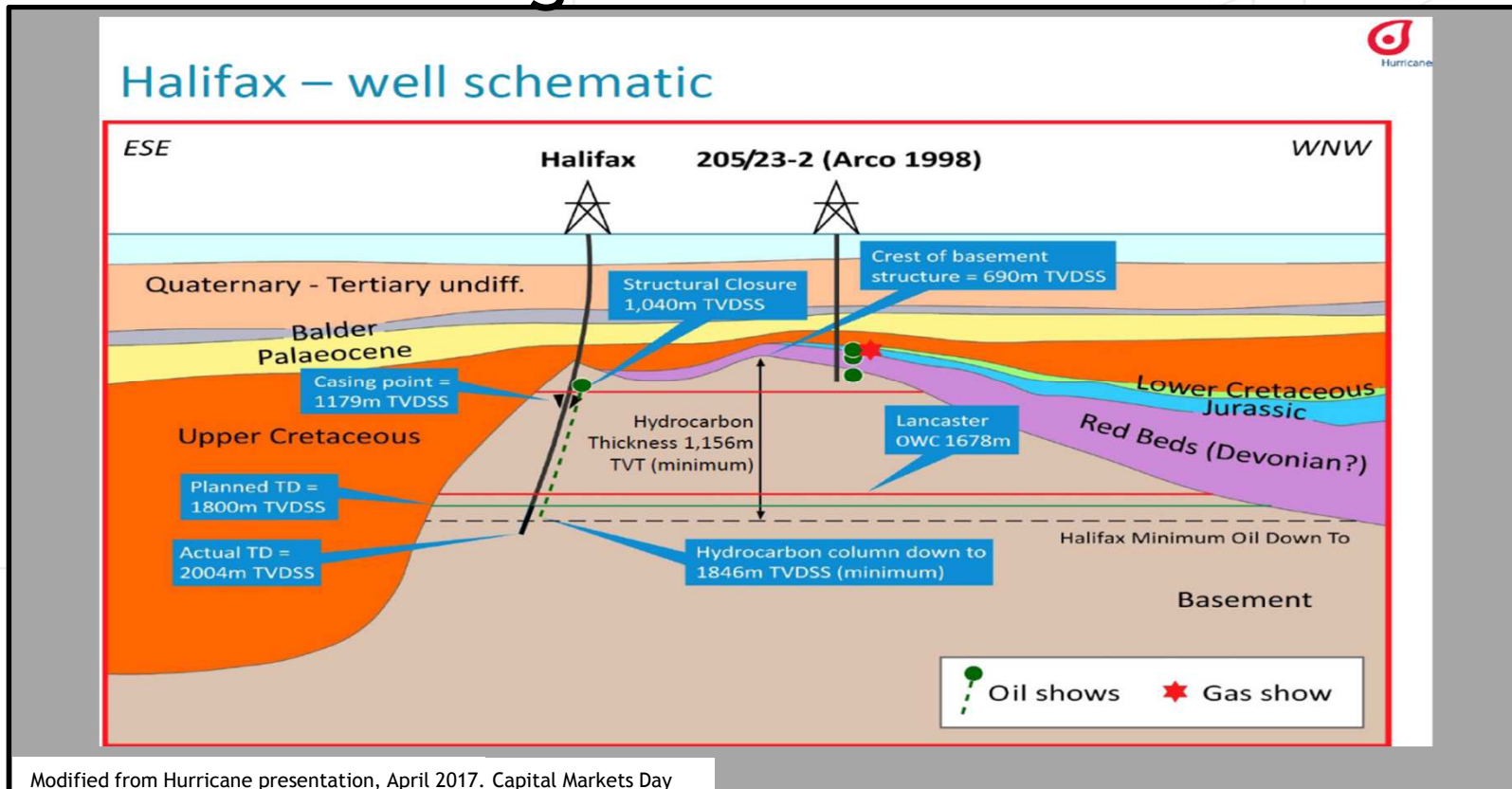
PGS15-12300 Seismic Profile



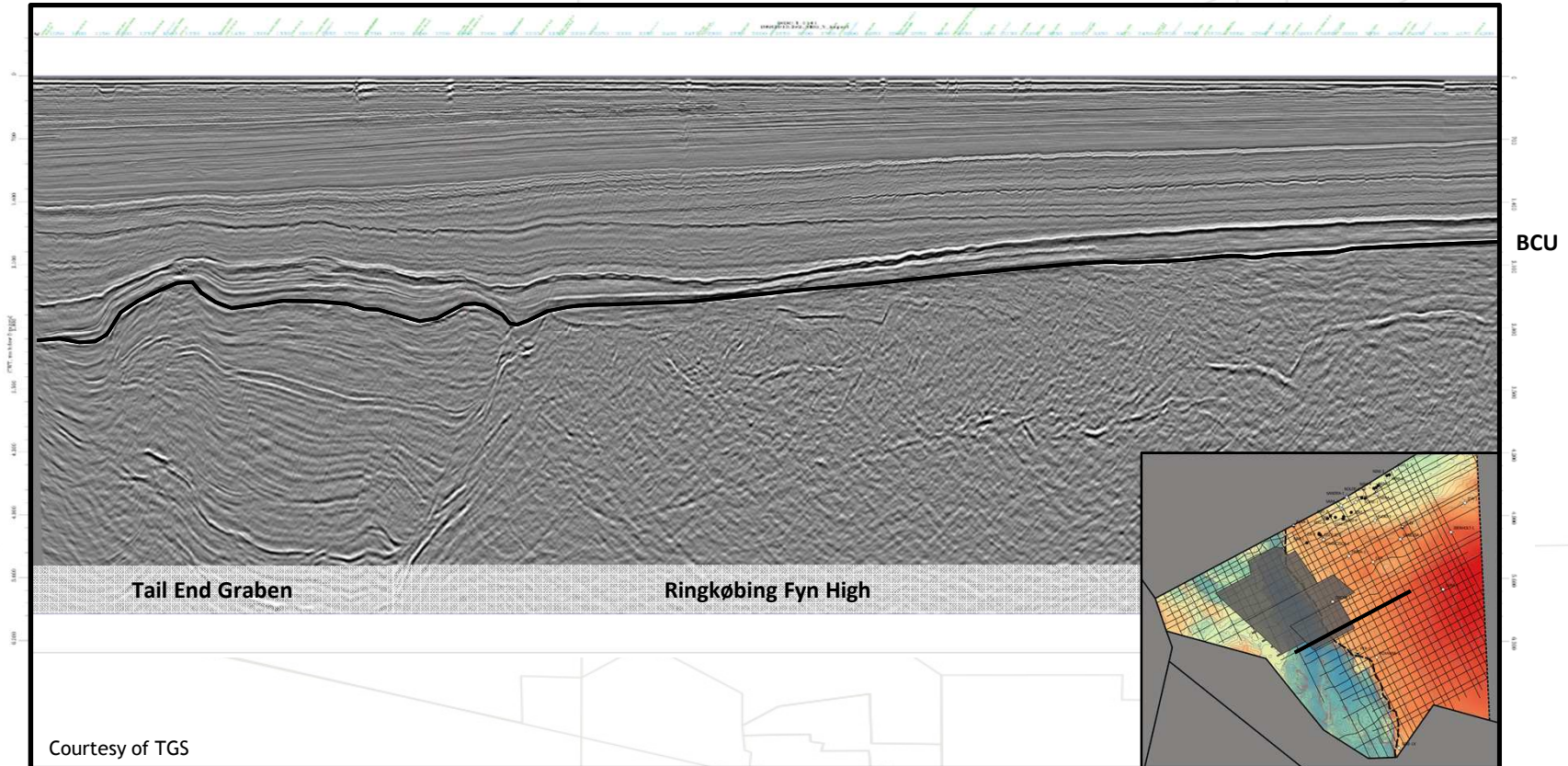
PGS15-12300 Geological Interpretation



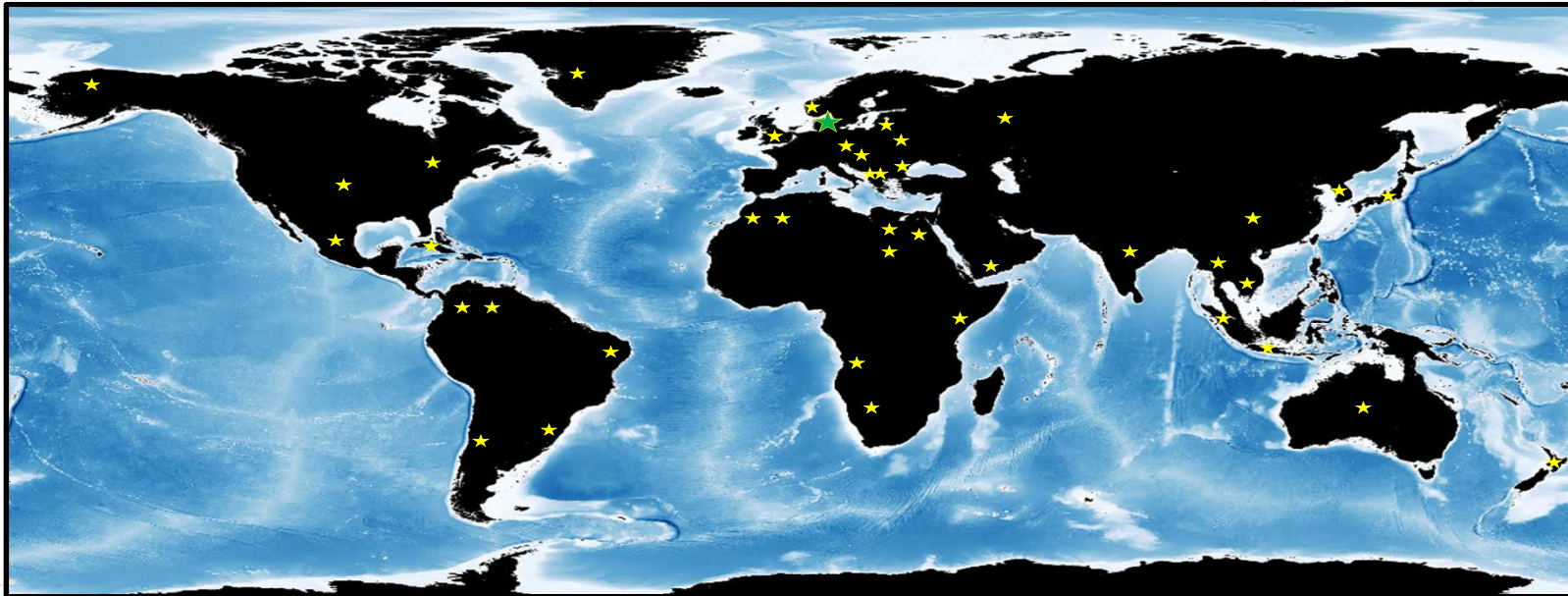
Possible Analogue



2D seismic - DKR13-1141



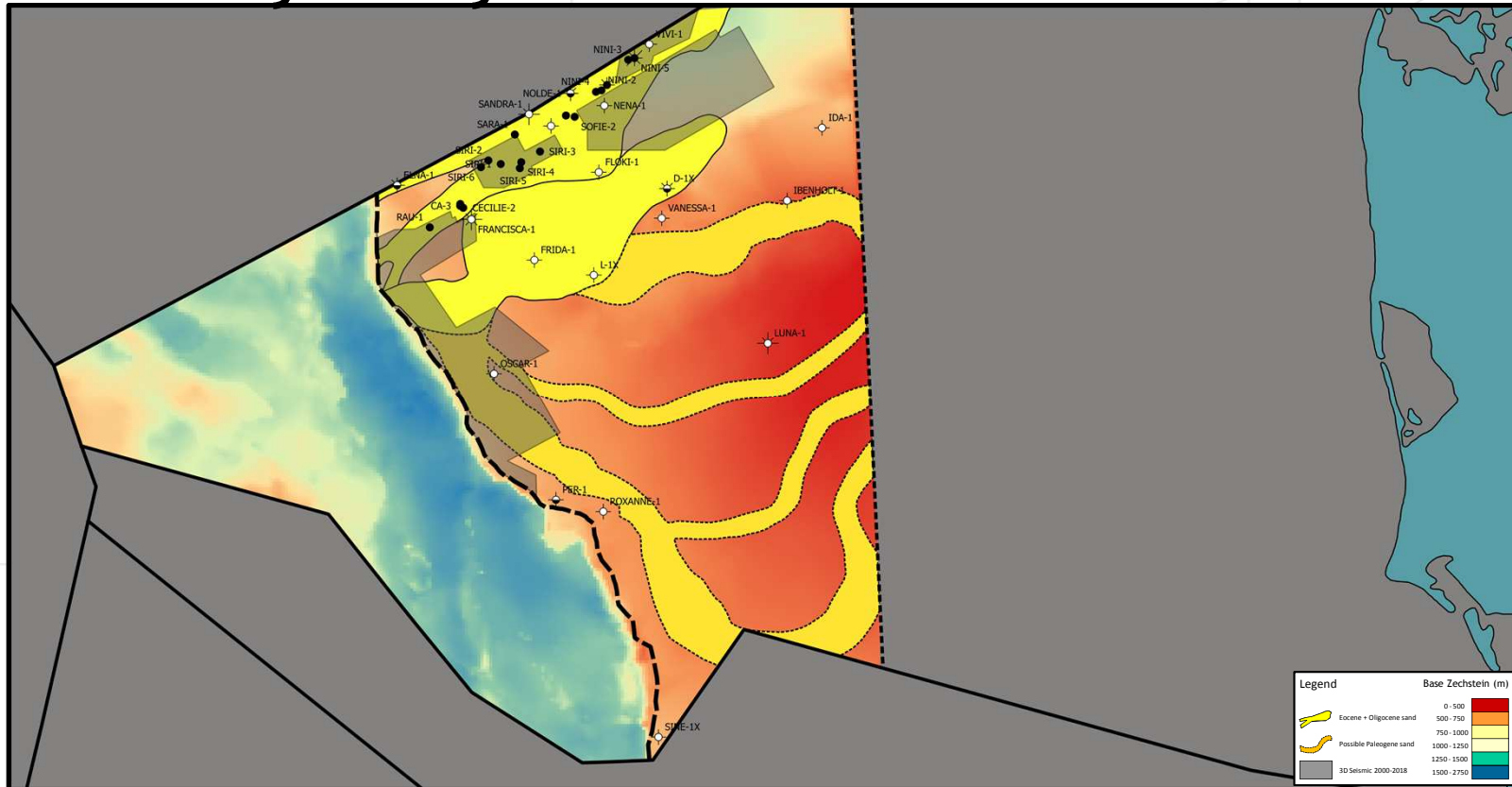
World-wide basement discoveries



Countries with reported HC discoveries in basement rocks

Algeria	Chad	Egypt	Kenya	Morocco	Serbia	Vietnam
Angola	Chile	Greenland	Korea	Namibia	Thailand	Yemen
Argentina	China	Hungary	Libya	New Zealand	Ukraine	
Australia	Czech Rep	India	Lithuania	Norway	United Kingdom	
Brazil	Croatia	Indonesia	Malaysia	Romania	United States	
Canada	Cuba	Japan	Mexico	Russia	Venezuela	

Tertiary Canyons on the RFH



Underexplored Plays

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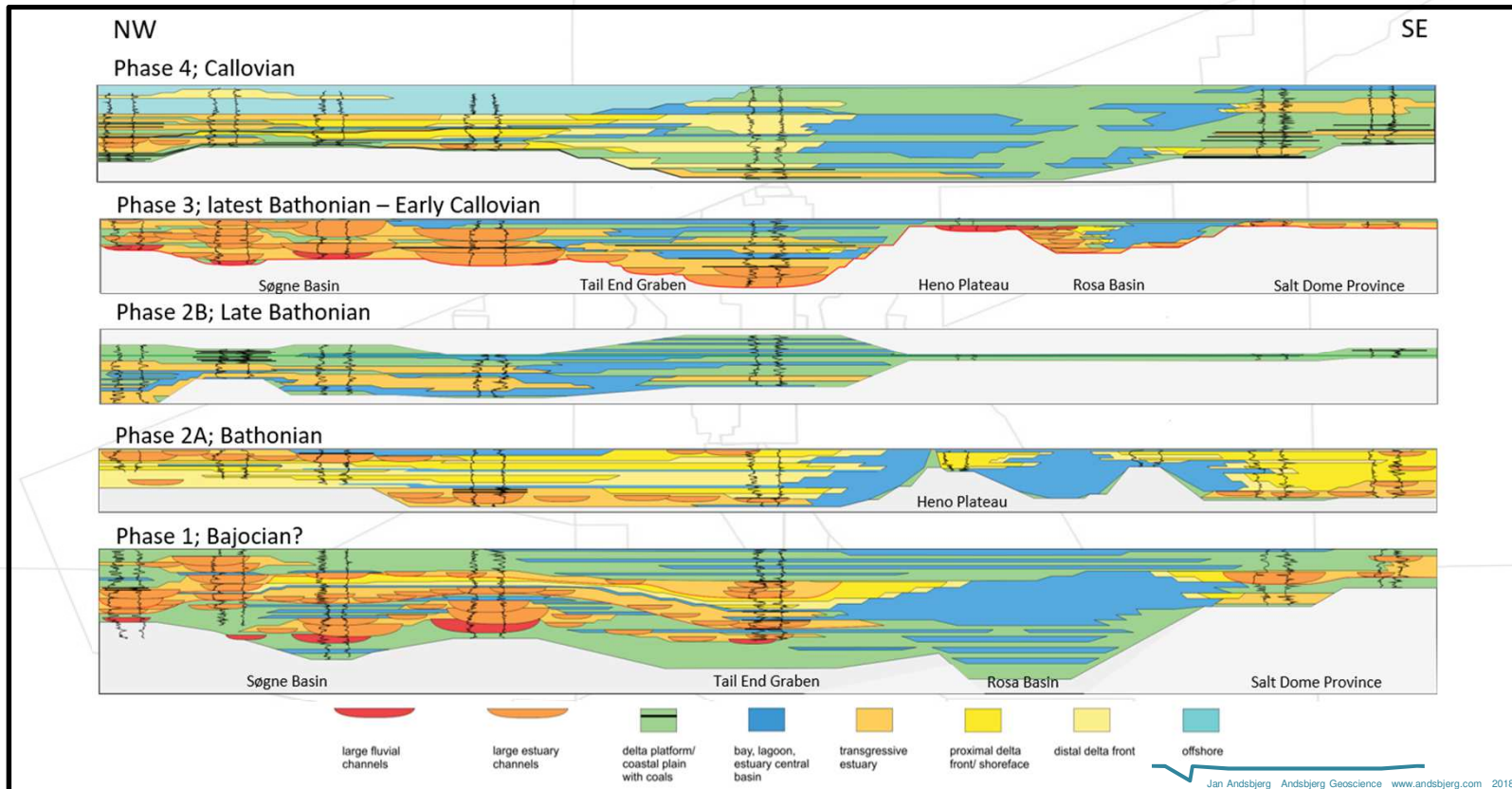
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2 Middle Jurassic Sandstones

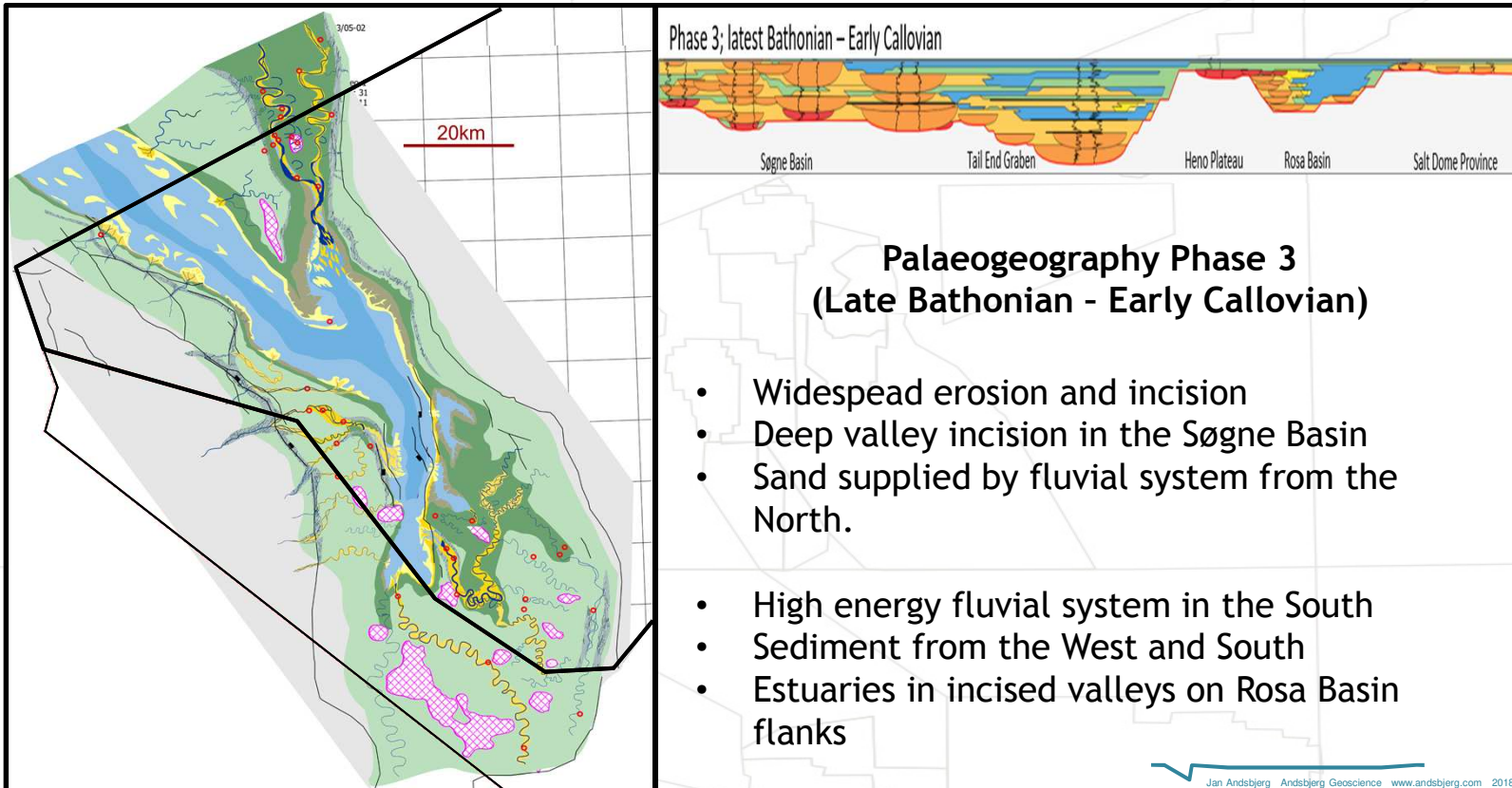
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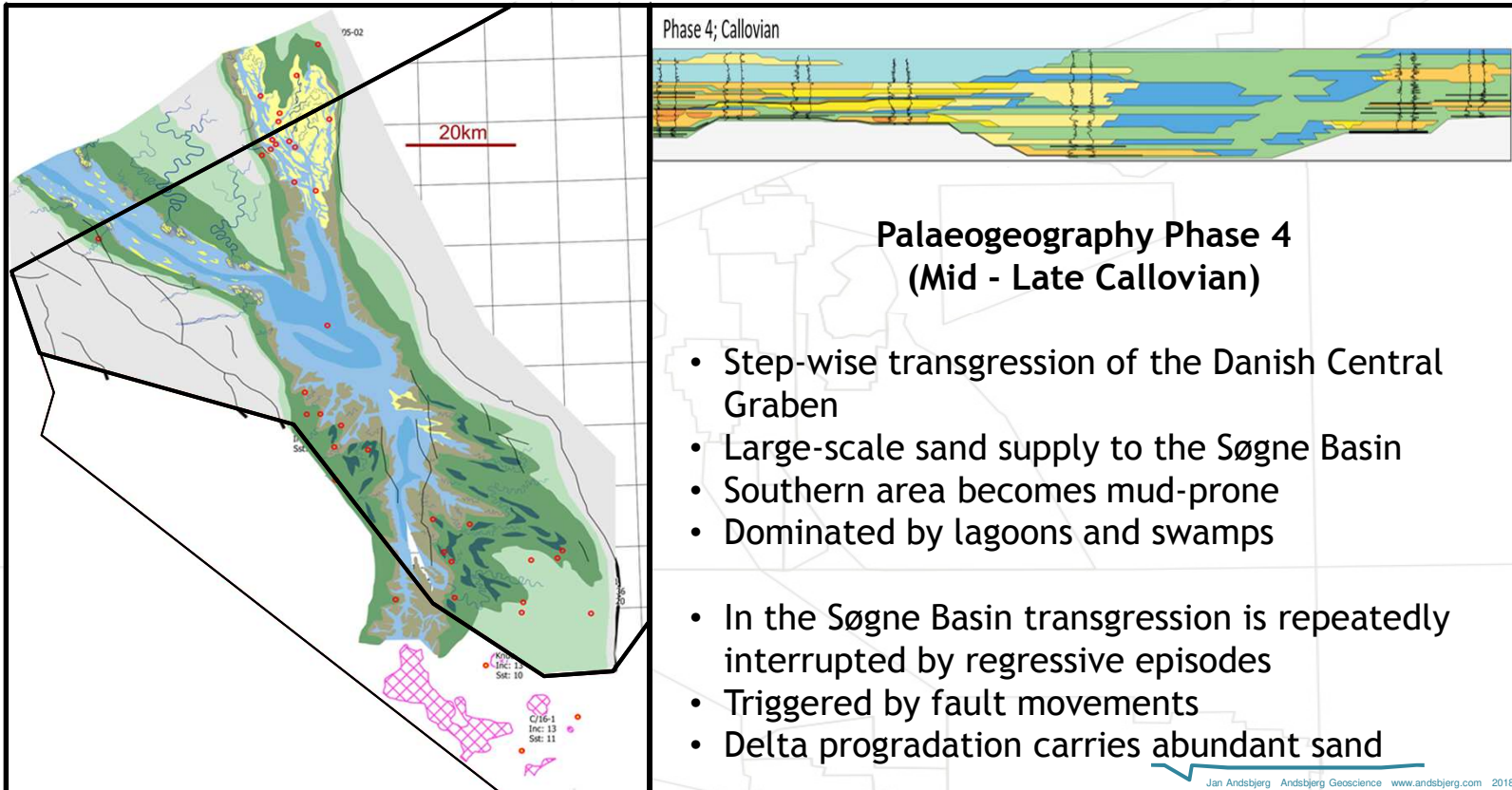
Sand distribution in 4 Phases



Middle Jurassic - Phase 3

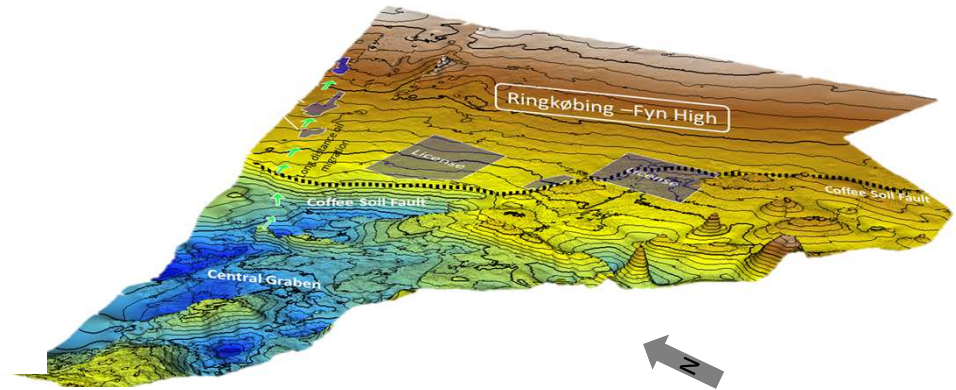


Middle Jurassic - Phase 4



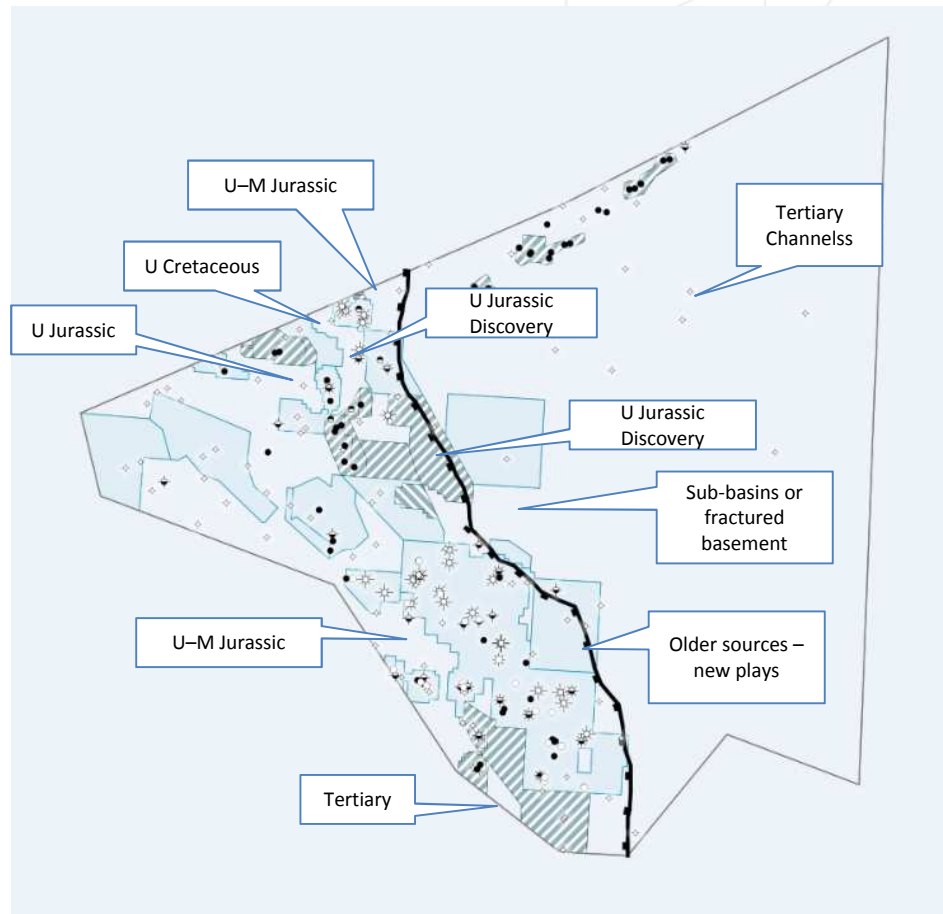
Summary - Still Underexplored

- Frontier exploration on the Ringkøbing-Fyn High
 - Weathered basement
 - Local sedimentary basins
 - Tertiary canyons
- More work to be done outside of the proven chalk play
 - Cenozoic shallow potentials
 - Lower Cretaceous tight chalk or sandstones
 - Upper Jurassic fan systems
 - Deep seated Middle Jurassic incised valleys
 - Older reservoirs - older sources still to be explored



Significant Potential

- More than 90 pct. of the production from Chalk
- 3 billion barrels oil equivalents in ground
- Remaining potential consists of a range of small and medium sized exploration targets
- Medium an larger sized stranded discoveries to be evaluated for appraisal and development



8th Licencing Round - Relevant players



- Legislation and regulation
- Conditions and further information
- Application



- Technical consultancy/G&G advisor
- Data provider

- State Partner (20 pct)

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Still more to explore in the Danish Area

Thank you!

Inger Salomonsen, Exploration Manager
Søren Holm, Senior Geoscientist