Miocene across the North Sea Basin

Erik S. Rasmussen
Data:

25 Outcrops

60 boreholes

1000 km seismic data
Biostratigraphic zonation

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<th>Stage</th>
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**Dinoflagellate events**
- *Amicosphaera umbrosula*
- *Heterophyllum multistriatum*
- *Bassinidium placenium*
- *Molosphaeridia chamaephyraeum*
- *Reussiophyllum ascosphaeroides*
- *Bassinidium evaginatum*
- *Erythrophiurn obtusum*
- *Sulphuraphyllum obtusum*
- *Hirsutophyllum obtusum*
- *Bassinidium evaginatum*
- *Heterophyllum multistriatum*
- *A. umbrosula*
- *A. umbrosula*
- *Pelecodonidium miocenium*
- *A. umbrosula*
- *A. umbrosula*
- *U. aequoductum*
- *L. truncatulum*
- *L. truncatulum*
- *C. aubryi*
- *C. aubryi*
- *E. insigne*
- *C. aubryi*
- *C. aubryi*
- *S. hamulatum*
- *T. pelagica*
- *T. pelagica*
- *C. aubryi*
- *C. aubryi*
- *D. phosphatica*
- *D. phosphatica*
- *D. phosphatica*
- *D. phosphatica*
Geological processes sea level changes vs. tectonism
Miocæn tektonik: inversion a Central Graven

Top Eocæn
Miocene tectonism: reactivation of the R-H High

Top Lower Miocene

Miocene

Basis Miocene

Upper Oligocene

Ringkøbing-Fyn High

Top Chalk

Denmark

Felicia-1

Hans-1
Correlation between climate changes and Miocene sequences

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Legend:
- SW: South West
- NE: North East
- I: Sequence I
- G: Sequence G
- H: Sequence H
- F: Sequence F
- E: Sequence E
- D: Sequence D
- C: Sequence C
- B: Sequence B
- A: Sequence A

Lithostratigraphy:
- Gram Fm
- Hodde Fm
- Arnum Fm
- Odderup Fm
- Kolding Fjord
- Ribe Fm
- Auning sand
- Bastrup sand
- Fasterholt Mb
- Vente Fjord Clay Mb
- Brejning Clay Mb
- Branden Fm
- Viborg Fm
- ? Linde clay
- ? Klintehoved Fm
Modified from Knox et al. In press
Conclusions

A robust stratigraphic framework has been established for the Neogene succession in the North Sea Basin.

The deposition was controlled by both tectonism and eustatic sea-level changes.

The southern North Sea Basin: dominated by widespread coal formation – balanced subsidence and sediment supply.

The northern North Sea Basin: limited accommodation was favourable for deposition of sand-rich systems.

Extreme good reservoir sands were deposited in association with sedimentation during falling sea level and within incised valleys during the early sea-level rise.

Sealing rocks were deposited during flooding and in association with tectonism (regional subsidence) where a widespread carpet of a sealing rock was deposited.