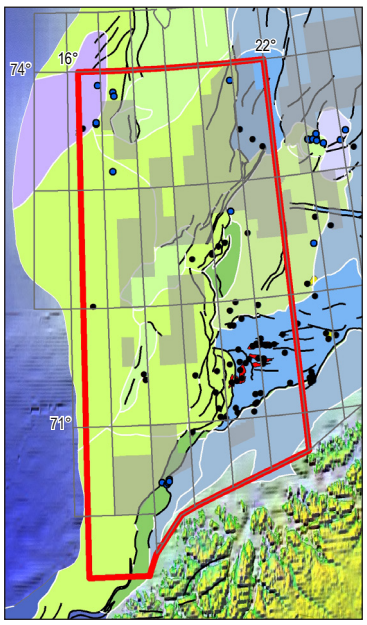
Western Barents Sea Study 2012 (WBS 2012)

Mesozoic play types: evaluation and uncertainty

The continuation of the recent exploration success in the Norwegian Barents Sea will require sophisticated analysis of petroleum systems and play types. SINTEF Petroleum Research has accomplished a petroleum systems modelling study that focuses on the evaluation and uncertainty analysis of selected Mesozoic play types in the western Norwegian Barents Sea. AGR (assisted by APT), Geotrack and Fugro Geolab Nor are co-operation partners.

The study integrates comprehensive geochemical, thermal, and pressure databases provided by our co-operation partners and from public sources. All depth maps and fault structures are derived from a consistent interpretation of the latest released public seismic and re-evaluated formation tops. These datasets form the framework for base-case models of palaeo-water depth, source-rock quality, burial and thermal histories (considering fission-track results), organic matter maturation, formation pressure, hydrocarbon expulsion and secondary migration.

Monte-Carlo-type simulations have been performed to characterize uncertainties and variations in the Mesozoic play-type models. Statistical analyses of the results are used to identify key risk factors for petroleum generation, secondary migration and trapping in this tectonically strained area. Particular attention has been laid on the representation of the complex geological history (e.g. erosion events) in the model.



Project area (red), blocks nominated for the 22nd licensing round (grey), exploration wells (black), and shallow stratigraphic coreholes (blue).

This study is immidiately available for purchase. Price quotation are given upon request.

Deliverables

- Maps of statistical analysis of most likely petroleum entrapments in 3 carrier-rock units
- Uncertainty analysis of key parameters in secondary petroleum migration models
- Maps of the base-case model scenarios for
  - thermal histories (all horizons),
  - erosion maps for selected time steps,
  - burial histories for source- and carrier rocks,
  - fluid pressure histories in the carrier rocks,
  - petroleum generation and expulsion histories from the source rocks, and
  - petroleum migration and trapping in carrier rocks.
- Source-rock property maps (thickness, TOC, HI) for 2 Mesozoic source rocks, based on organic facies modelling
- Maps of modelled palaeo-water depth for Lower Triassic to Base Quaternary
- Depth maps from Lower Triassic to sea floor for 19 horizons (6 interpreted, 13 constructed, <500 m x <500 m grid)
- Temperature, pressure and geochemical databases (Excel)
- Report (paper and PDF)

All maps will be delivered in a consistent Petrel project or as grids. Other formats (ESRI shape files, Kingdom, Landmark) can be made available on request.

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