Advisory Group for the Ministry of Economic Affairs

TNO | Knowledge for business

TNO Built Environment and Geosciences
Geological Survey of the Netherlands
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The Netherlands

Petroleum-geological mapping

– Results Terschelling Basin and southern Dutch Central Graben
– Overview Central Offshore Platform, Texel-IJsselmeer High and Vlieland Basin

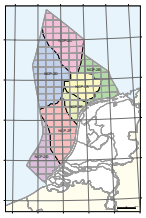


Figure 1 Location map showing an overview of the areas. The Terschelling Basin, the southern part of the Dutch Central Graben and the Central Offshore Platform, Texel IJsselmeer High and Vlieland Basin are located in areas 2A and 2E

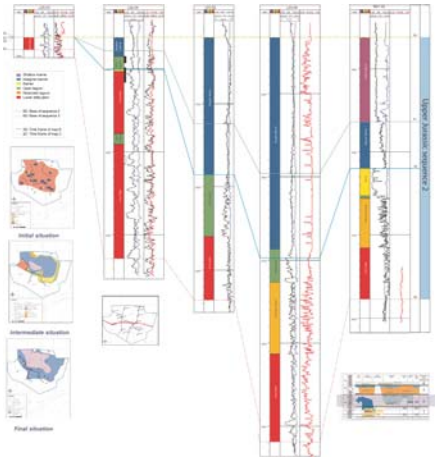


Figure 2 Sedimentological facies determination in the Upper Jurassic, using core descriptions, biostratigraphy and well logs

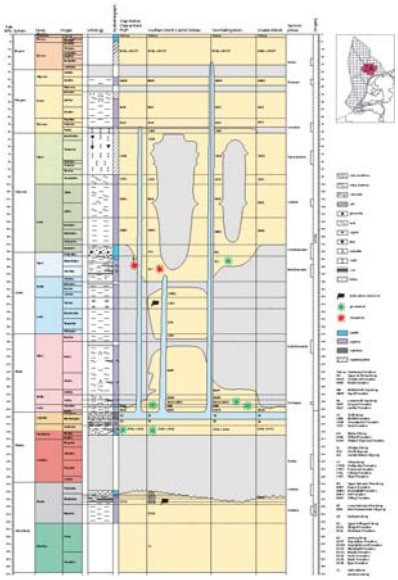


Figure 3 Tectono-stratigraphic chart of the Dutch Central Graben and Terschelling Basin. Time scale according to Gradstein et al. (2004)

Introduction

Within the conventional mapping framework of NCP-1 the Geological Survey of the Netherlands - TNO has started a detailed mapping program with emphasis on petroleum-geological topics, such as:

- facies analysis within a tectono-stratigraphic framework,
- petrophysical analysis of cored reservoir intervals,
- property modeling of actual and potential reservoirs,
- 3D burial history of source and reservoir rocks.

The aim of this study is to present a more comprehensive model of the subsurface to future and current operators in the oil industry in a basin-scale petroleum-system.

Area 2A

- depth maps and thickness maps of the major lithostratigraphic units
- 3D fault model
- lithostratigraphic diagram
- well correlations
- petrophysical analysis (report)
- sedimentological study (report)
- thickness maps of reservoirs
- source rock map of ATPO
- vitrinite reflectance of the Carboniferous
- maturity and burial diagrams
- pressure and temperature data

The final results of the petroleum systems study will be published on www.nlog.nl shortly.
A report on the geological and structural evolution of the Terschelling Basin and the southern part of the Dutch Central Graben with the focus on petroleum systems is in preparation.

Area 2B (2008)

Seismic interpretation
Well log correlation

Area 2C (2008)

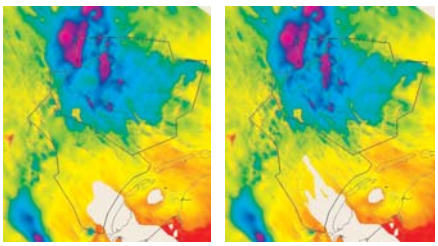
Seismic interpretation
Well log correlation

Area 2D (2009)
Area 2E (2008)

Structural model
Fault model
Petrophysical analysis

Area 2F (2009)
Area 2G (2010)

Results and work in progress Area 2A and 2E



NCP1 **base Zechstein (time)** **NCP2**

Figure 4 In the merged 2A-2E base Zechstein map (in time) it is shown that the refined mapping gives a greater degree of detail. In the 2E area there are lineaments NW of the Texel-IJsselmeer High which don't show on the NCP1 map. In de 2A area 3D interpretations were used in the NCP1 mapping and the difference is less obvious. The areas around the salt domes however are more pronounced and less fuzzy

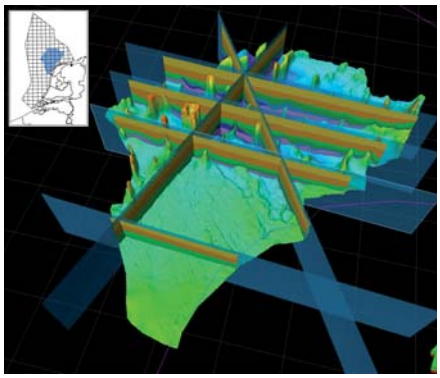


Figure 5 Construction of cross-sections in the depth model of area 2A and 2E

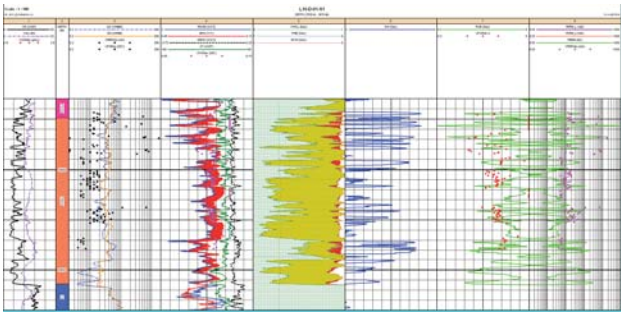


Figure 6 Petrophysical interpretation of the Lower Slochteren Sandstone Member in well L10-D-01-S1. For the Rotliegend Group 17 wells have been analysed in area 2E

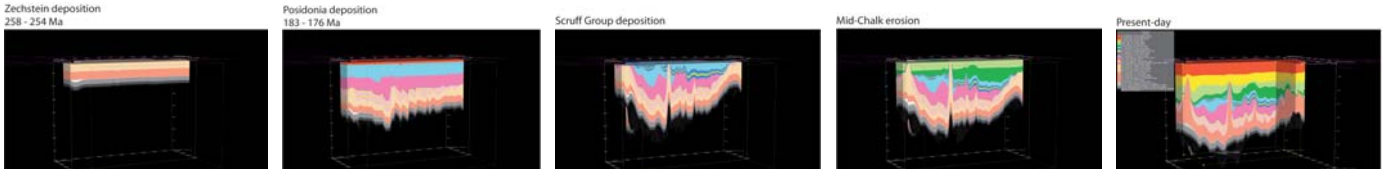


Figure 7 Burial history in the 2A area using backstripping and forward modeling techniques. The section runs west-east