GEO4240: 3D Seismic Interpretation Project

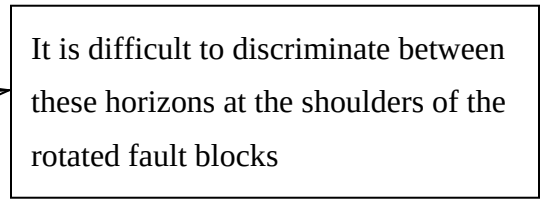
STRUCTURAL GEOLOGY PROJECT: Jura reservoir in the Troll Field (block 31/2)

Phase 1:

- Geological framework (study key literature).
- Interpret 2D seismic line SG8043-402 over the Horda-platform (through 3D).
- Stratigraphic calibration in well 31/2-4 (SP 4070).

Phase 2:

- Interpret a series of chosen reflectors in vertical sections (a limited number of inlines and crosslines and the 2D line):
    - With well 31/2-4 as a starting point you have to identify and interpret:
      Base Eocene
      Base Tertiary
      Base Cretaceous
      Top Sognefjord Formation
      Top Brent Group



- Focus on the interpretation of the fault pattern in the fault block.
- Generate a random line along the 2D seismic line SG8043-402 and compare the 3D and 2D data. Discuss (observed) differences in resolution.
- Correlate reflectors over the main faults and discuss when these faults were active.
- Make time-structure maps of:
    - Top Brent Group - horizon.
    - Base Eocene - horizon. (Most of the interpretation can be down using Automatic Seismic Area Picking (ASAP).
- Study anomalies in the seismic response on the presence of gas and the lateral extent of the gas-reservoir. Use vertical and horizontal sections.
- Check other seismic attributes than amplitude.
- Use different tools for visualization of the interpretation (Geocube).

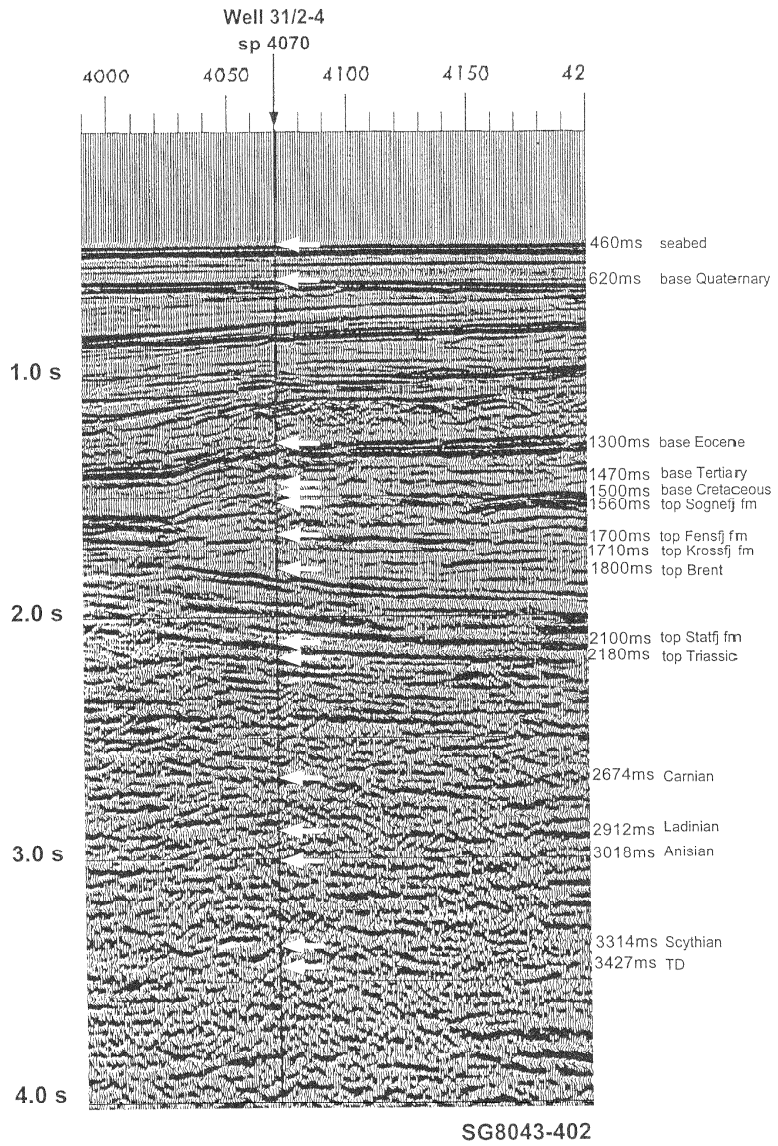
STRATIGRAPHY/SEDIMENTLOGY PROJECT: Miocene channels in block 35/8

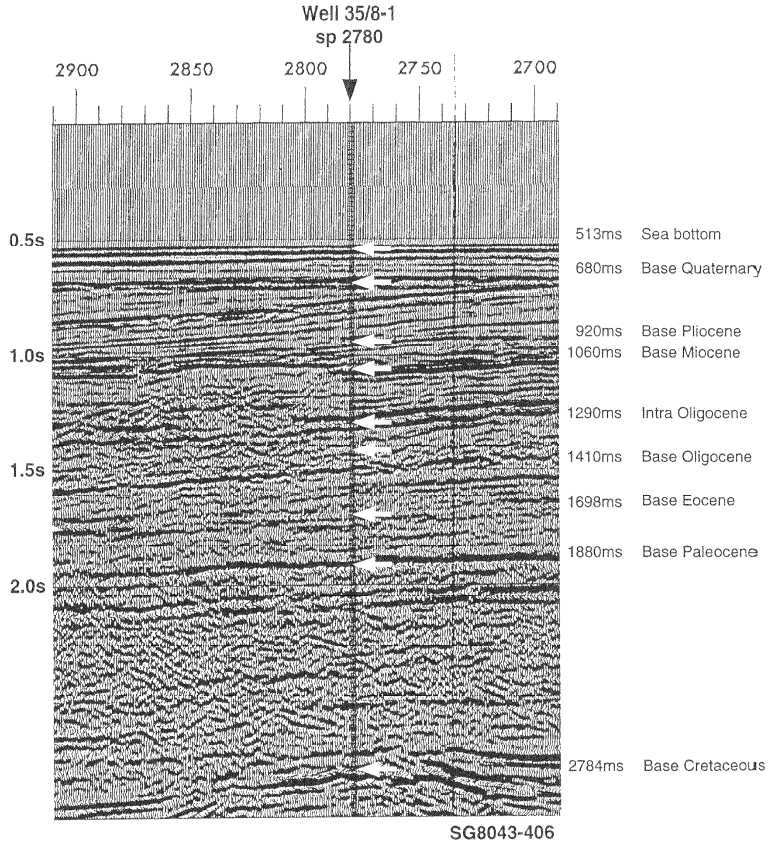
Phase 1:

- Geological framework (study key literature).
- Interpret 2D seismic line SG8043-406 over the Horda Platform (through 3D).
- Stratigraphic calibration of well 35/8-1 (SP 2780)

Phase 2:

- Interpret a series of chosen reflectors in vertical sections (a limited number of inlines and crosslines and the 2D line).
    - With well 35/8-1 as a starting point you have to identify and interpret
      Base Quaternary
      Base Pliocene
      Base Miocene
      Intra Oligocene
- Focus on the interpretation of Miocene channels and Oligocene mud-diapirs.
- Generate a random line along 2D seismic line SG8043-406 and compare the 3D and 2D data. Discuss (observed) differences in resolution.
- Make a time-structure map of the base Miocene horizon.
- Make a map that shows the thickness of the Miocene sequence (requires interpretation of base Pliocene).
- Study the seismic response and the lateral extent of the Miocene channels and Oligocene mud-diapirs. Use vertical and horizontal sections and horizon slices.
- Check other seismic attributes than amplitude.
- Use different tools for visualization of your interpretation (GeoCube).


Well 31/2-4
sp 4070
4000
4050
4100
4150
42
1.0 s
2.0 s
3.0 s
4.0 s
460ms seabed
620ms base Quaternary
1300ms base Eocene
1470ms base Tertiary
1500ms base Cretaceous
1560ms top Sognefj fm
1700ms top Fensfj fm
1710ms top Krossfj fm
1800ms top Brent
2100ms top Statfj fm
2180ms top Triassic
2674ms Carnian
2912ms Ladinian
3018ms Anisian
3314ms Scythian
3427ms TD
SG8043-402


Well 35/8-1
sp 2780
2900
2850
2800
2750
2700
0.5s
1.0s
1.5s
2.0s
513ms Sea bottom
680ms Base Quaternary
920ms Base Pliocene
1060ms Base Miocene
1290ms Intra Oligocene
1410ms Base Oligocene
1698ms Base Eocene
1880ms Base Paleocene
2784ms Base Cretaceous
SG8043-406

General guidelines for the interpretation report, course GEO4240

A typical structure/outline for the report is as follows:

Introduction

Text: Shortly about the approach to the problem

Figures: Location of the research area

Geological setting

Text: Short introduction to the geology (structure, stratigraphy, development) in the northern North Sea with special emphasis on the main approach to the problem (see literature in Classfronter)

Figures: Map + type profile(s) from the key literature

Seismic interpretation

Text: Seismic-well correlation
Interpretation strategy/procedure
Use of different interpretation techniques (Time slice, horizon slice, attributes)

Figures: Seismic section through the well
Seismic examples (different lines, slices)

Results/discussion

2D vs 3D comparisin

Text: Comparison/discussion of seismic resolution

Figures: Random line based on 3D seismic compared with the 2D seismic line present in the project

Structural or stratigraphic interpretation

Text: Main results and important observations

Figures: Seismic examples (vertical sections, horizontal sections, composed sections, horizon slices)
Time-structure map on key-horizons (with and without interpolation)
Eventually time-isopach (time-thickness) maps

Attribute maps (dip, azimuth, etc.)

Detailed interpretation

Text: Special phenomena (channels, diapirs, faults, flat spots, etc.)

Figures: Seismic examples

Visualization (3D)

Conclusion

Text: Main results – what have you learnt….?

References