The quaternary ‘chaotic zone’

In the early interpretations before the two ‘shallower’ and ‘deeper’ seismic working groups were defined, the chaotic zone was interpreted and presented to GlaciStore consortium members. As a result of a brief (due to time constraints) literature search it appears that this zone hadn’t been noted before. The ‘chaotic zone’, as the name suggests is a seismic package of discontinuous and variable amplitude reflections developed above the basinward toe region of a large prograding unit. What this unit represents needs more investigation, but it potentially shows shelf erosion and basin deposition in mass flow events as basin-centre fill. It may have already been interpreted and reported previously, so a more substantial literature search would be required.

Interpreting the Eocene events

Further work could be carried out on interpreting the eastward prograding units within the Horda Formation in the UK sector. Mapping these features in 3D seismic volumes and their correlation with relevant well data would provide a better understanding of the type of system tracts observed (highstand, lowstand etc), and potentially with a good interpretation the different phases of deposition and flooding, could be correlated with both global sea level change and Shetland Platform uplift events. Understanding these events and subsequent deposits could be useful for characterising the overburden both for sealing lithologies and for potential deeper porous sandstone bodies for CCS storage sites. Perhaps also some of the parasequences identified within the Horda Formation could be targeted as storage sites (e.g. as secondary targets) or as important potential migration pathways.

The grid sandstones

The Grid Sandstones (Horda Formation) are Mid Eocene to Early Oligocene sandstones, described in Knox and Holloway (1992) as submarine fan deposits in the lower part and dominantly shelf deposits in the upper part, consisting of fine to medium grained sandstones with a ‘blocky’ wireline log signature. These sandstones seem to occur towards the basin centre (eastern margin of the prograding units), clearly visible in the geophysical well logs and seismically definable within the mudstones of the basin centre Horda Formation. However, after a literature search, they seem to be poorly mapped. Further work may find and map these features in 3D seismic, following a similar methodology to that outlined in Kilhams et al. (2011), who successfully mapped a similar older feature in the Tay Sandstone in close proximity to the Forties field (further south than the area of interest for this study). Defining these features could be useful in assessing primary or secondary storage sites which, if not considered for storage, could provide migration pathways within the overburden from any deeper storage sites.
Mapping tunnel valleys

There is scope for further systematic mapping of buried tunnel valleys within the areas surrounding the potential IODP sites using the PGS 3D seismic data. Cross-cutting between tunnel valleys is apparent and it should be possible to map out the tunnel valleys and their overprinting in a way similar to that described in Stewart and Lonergan (2011)\(^1\).

References


Retrieved from 'http://earthwise.bgs.ac.uk/index.php?title=OR/15/072_Interesting_features/further_work&oldid=29596'

Category:

- OR/15/072 A summary of the methodology for the seismic stratigraphic interpretation for the 'GlaciStore' bid to IODP

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