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Sedimentological Description of 5 gravity cores from the Faroe- Shetland Channel

Internal Report IR/03/047

BRITISH GEOLOGICAL SURVEY

INTERNAL REPORT IR/03/047

Sedimentological Description of 5 gravity cores from the Faroe- Shetland Channel

Alick Leslie

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background and planning for any
area. *British Geological Survey
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1 Introduction

Five gravity cores were taken from the continental slope north of the Shetland Isles as part of a transect from the shelf (150 m water depth) to the base of slope (100 m). A total of 19 cores were taken, the other 14 of which were sampled using a multicorer. The 5 gravity cores were taken in water depths between 790 and 990 m with the intention of identifying whether contouritic sediments were forming or had formed at sea bed in the study area. Such sediments have been recovered in equivalent depths to the south, and have been identified in backscatter both south and north of the study area. As a result of equipment failure these 5 cores were not split and described on board ship.

Details of the cruise including core locations and sampling methods are given in Leslie (2002).

The 5 cores have been logged using a binocular microscope. Rough, handwritten logs are appended at the back of the report. The trends described are a qualitative assessment of core character. The discussion is based on a preliminary examination based on subjective observations and is not meant to be taken as a conclusive interpretation of the cores.

2 Results

The sediments recovered in all 5 gravity cores show muddy sand overlying slightly sandy mud. The sediments are greyish brown, colour differences are subtle and poorly

The 5 cores appear to show a decrease in dropstone abundance with depth.

In the 4 cores from 850 to 990 m water depth following trends can be identified.

- The top sand horizon is a well sorted, fine to very fine sand at 850 m and becomes more mud-prone and less well sorted at depth. At 990 m the top muddy sand is difficult to distinguish from the underlying sandy mud.
- The sand fraction is composed of approximately 80% quartz and 20% foraminiferal and other calcareous biogenic fragments.
- The sand is firm at 850 m and becomes firm to soft at greater depths.
- The contact between the two units is deformed by bioturbation and difficult to identify.
- The top sand is taken down up to 0.30 m in *Planolites*-like burrows.
- In the underlying soft muds, burrowing is most distinct in the core from 850 m. There are abundant *Planolites*-like and uncommon *Chondrites*-like burrows. At 990 m the muds might be best described as biodeformed, with uncommon distinct burrows and no visible sedimentary structure.

- The core at 850 m shows two beds 20 mm in thickness, distinguished solely on basis of colour, slightly reworked by bioturbation.

The core at 790 m depth contains 60 mm of very soft, muddy sand overlying slightly sandy mud containing abundant black sulphide that becomes increasingly crystalline with depth.

- The sand consists of well sorted quartz and foraminifera.
- The contact between the sand and underlying muds is sharp and undisturbed by bioturbation. The overlying sand is not observed below the contact.
- The underlying sandy muds contain black sulphide that delineates bioturbation. In the upper 0.70 m the sulphide is disseminated within the sediment, below 0.70 m the sulphide forms distinct, semi-crystalline masses related to burrows.

3 Discussion and Conclusions

Between 840 and 890 m a well sorted fine sand indicates the presence of active current sorting of the sea bed sediment.

The progressive reduction in contrast between this sand and underlying sediment with depth suggests a diminishing of this current below 900 m.

The difference in sediment character between the core at 790 m and the others suggests a different environment, possibly related to boundaries between water masses. If so, the sorting locus around 850 m might relate to turbulence at this boundary.

4 Further work

The qualitative examination of 5 cores has suggested several potential trends and relationships in the sedimentology / oceanography of the area. A rigorous examination of the sedimentology should include.

- Examination of all of the cores taken in the transect.
- Assessment of existing sea bed data.
- Quantitative particle size analysis of the sea bed sediments to confirm trends.
- Comparison of gravity core and multicore data where sample sites are at the same depth to quantify differences in sampling methods.

References

LESLIE, A B. 2002. MV Kommandor Jack Cruise 2002 – Geological Sample Descriptions. . *British Geological Survey Commissioned Report*, CR/02/230.