

# **Review of Survey activities 2005**

*Edited by*

Martin Sønderholm and A.K. Higgins

## Geological Survey of Denmark and Greenland Bulletin 10

### Keywords

Geological Survey of Denmark and Greenland, survey organisations, current research, Denmark, Greenland.

### Cover photographs from left to right

1. The barrier reef complex fringing most of the Kenya coastline is also one of the most vulnerable environments to pollution. A new *Oil Spill Sensitivity Atlas* for Kenya helps to prioritise the emergency response on the most susceptible areas (see article, page 65). Photograph: John Tychsen, GEUS.
2. Vibro-seismic data were acquired on Stevns, Denmark to be able to correlate the Danian–Campanian cores drilled along the east coast of Stevns (see article, page 13). Photograph: Lars Stemmerik, GEUS.
3. Farming on the rooftops. Experiment carried out at GEUS to investigate concentrations of pathogens leached to drainage water as a result of different slurry manure application methods. Photograph: Peter K. Warna-Moors, GEUS.
4. Refuelling of helicopter on the Arctic Sea ice during seismic acquisition programme related to data collection for the *Continental Shelf Project* around Greenland. Photograph: Trine Dahl-Jensen, GEUS.

### Frontispiece: facing page

Thrust sheet pair exposed in the Rubjerg Knude Glaciotectonic Complex, Vendsyssel, Denmark. Photograph: Stig A. Schack Pedersen, GEUS.

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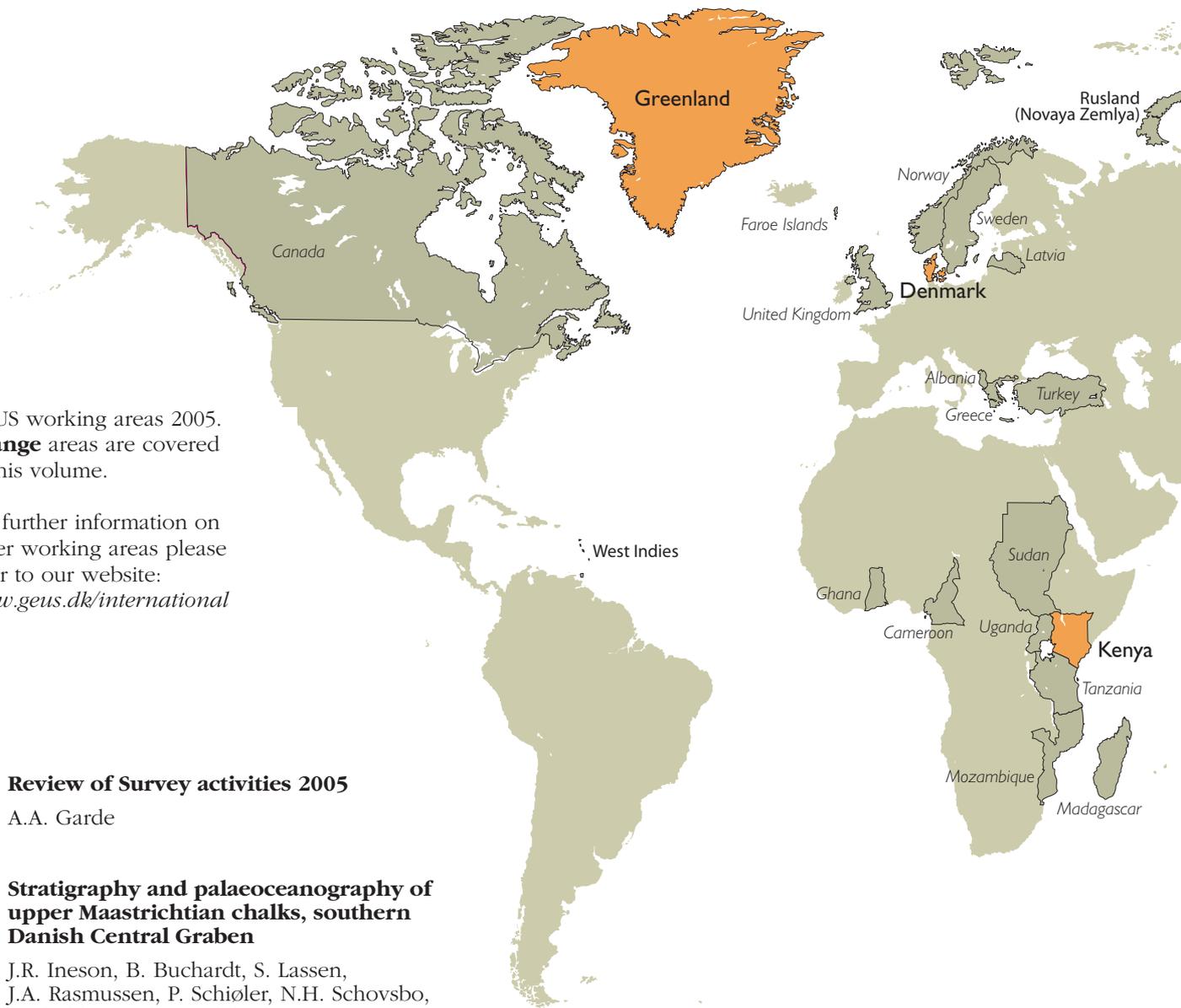
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Geological Survey of Denmark and Greenland (GEUS) • Øster Voldgade 10 • DK-1350 Copenhagen K • Denmark  
Phone: +45 38 14 20 00, fax: +45 38 14 20 50, e-mail: geus@geus.dk

or

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GEUS working areas 2005.  
**Orange** areas are covered  
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# Review of Survey activities 2005

Adam A. Garde

Chief editor

The present volume is the third issue of *Review of Survey activities* (RoSa). It contains 15 four-page contributions that cover a wide range of the current activities at the Geological Survey of Denmark and Greenland (GEUS). Thirteen of these are short scientific papers dealing with ongoing research by the Survey and its external partners. For the first time the research-based papers in the Review are now externally peer reviewed. A new standing panel of reviewers for RoSa has been established to ensure that the contributions are of general interest to a wide readership and that, within the limitations of space, they maintain the normal scientific standards of the Survey's publications. All articles are planned to be easily readable by non-specialists, and since this is a Review of Survey activities, it should be borne in mind that many papers are first accounts of ongoing research.

The fact that almost all contributions in the current volume are scientific in nature implies that while providing a timely panorama of current research at the Survey, they are far from embracing all projects undertaken by the Survey in Denmark, Greenland and other countries in 2005. A factual overview of the activities of GEUS as a whole can be obtained at GEUS' website.

In the present volume three papers deal with Cretaceous–Holocene onshore and offshore stratigraphy, sedimentology and palaeoceanography in Denmark, in part related to hydrocarbon exploration. A fourth paper from Denmark, that illustrates just one of the broad spectrum of the Survey's routine responsibilities undertaken on behalf of the state, addresses construction of 3D geological models to characterise the migration of point-source pollution in groundwater reservoirs.

Projects related to Greenland and the Arctic in general are represented in this volume by a group of nine papers. The

first is a methodology paper describing advanced *in situ* geochronological and trace element microanalysis by laser ablation techniques, a now routine analytical tool at the Survey that has provided data for several of the subsequent articles, including a study of sediment provenance in the East Greenland – Faroe Islands – Shetland region, and an account of zircon geochronology applied to Archaean geological studies in southern West Greenland. Within the same region, a new method of integrative and quantitative assessment of the gold potential is presented, and two papers deal with newly discovered kimberlites and carbonatites and their potential economic significance. One paper describes five profiles through basalts and sedimentary rocks in the Nuussuaq Basin in West Greenland, constructed using geological photogrammetrical techniques along coastal cliffs and steep valley sides. Another paper presents new evidence for the presence of continental crust in the Davis Strait obtained from seabed sampling; this is an important new contribution to the long-standing debate of the nature of the crust under the Labrador Sea and Davis Strait and its stratigraphy. A report on ongoing studies of the deep crustal structure of Greenland using earthquake seismology is presented, and a last paper concerning the Arctic region describes radical former climatic changes in the Arctic Ocean and the geophysical signature of the Lomonosov Ridge north of Greenland, and discusses the sensitivity of the sea-ice cover to global warming.

The final paper in the present volume describes the development of an environmental sensitivity atlas for coastal areas of Kenya. This project is just one of several current GEUS projects where the Survey's broad technical and managing expertise is put to use in developing countries.