

## Editorial

The Arctic areas are presently in the focus of the public eye as a result of the discussions about climate change and natural resources. Geoscientific research in these vast and remote areas, however, has not lost its challenging character because the climatic conditions and logistical problems remain. Furthermore, research in these areas still represents a move to unknown regions. It has become apparent that such work can only be accomplished by international cooperation.

The Arctic consists of a central ocean area, the Arctic Ocean, which includes the Eurasian and Amerasian basins, and is bordered by the continents of Eurasia and North America (including Greenland; see Tessensohn et al. 2012: Fig. 1). The Eurasian oceanic basin has been opening continuously since about 55 million years ago, contemporaneously with the northern part of the North Atlantic separating Eurasia from North America and Greenland. Knowledge of the history and structure of the older Amerasian Basin (that includes the Canada Basin, the Makarov Basin and the Alpha-Mendeleev Ridge) is still very limited. Access to the Arctic marine regions is made difficult by the glaciation and climatic conditions. However, many parts of the surrounding coastal areas are ice-free and also snow-free during summer seasons, and are therefore accessible for geological field work.

Since the CASE program (Circum-Arctic Structural Events) started in 1992, the German Federal Institute for Geosciences and Natural Resources (BGR), together with scientists from Germany and many foreign countries, has been investigating the geodynamic evolution of the periphery of the Arctic Ocean including the reconstruction of the plate tectonic situations before and during its complex opening. Such investigations are important for the interpretation of the evolution and architecture of the still largely unexplored continental margins in the Arctic. They can provide information about the evolution of the Arctic shelves as well as of intra-continental basins and thus for the assessment of the possible resource potential. Another aspect is the long-term climatic evolution in the Arctic. During the Palaeocene and Eocene, for example, the time of the break-up of Laurasia, when the Canadian Arctic islands and Svalbard were adjacent at high latitudes above the Arctic Circle (see Tessensohn et al. 2012: Fig. 4), coal-forming swampy forests grew there.

To date, the BGR has carried out 14 onshore CASE-expeditions. Regional emphases were the Canadian Arctic with a focus on Ellesmere Island and the Nares Strait region, North Greenland, Svalbard and selected areas in the Russian Arctic. As research in the Arctic is conducted in sovereign territories of the Arctic states, direct cooperation with the geological surveys as well as universities and other institutions of the corresponding countries is mandatory (see Tessensohn et al. 2012: Tab. 2).

Tessensohn et al. (2012) give an overview of the CASE program and summarise the main scientific results. As the BGR's activities in the Arctic have been mostly published in English, this paper has been written in German so that these activities can become better known within Germany. The other articles, published in this and in a later volume of ZDGG, are based on the participation of the authors in the BGR's CASE expeditions to Svalbard and Ellesmere Island or on studies of rock or fossil material collected during these expeditions. Several methods such as structural geology, palaeontology, stratigraphy, sedimentology, geophysical well logging, petrography, geochemistry and geochronology are employed. Scientists from cooperating foreign institutes contribute their own pool of experience. For example, Sobolev (2012) presents geophysical well logging data from Russian offshore drilling in the Barents Sea and implications for uplift and erosion of the Barents Basin as well as for the petroleum system modelling.

Several members of CASE expeditions have published their results in various journals both before and after publication of the CASE 1 expedition results in a comprehensive volume (Tessensohn 2001). The present and next "Arctic" volumes of the ZDGG now provide an opportunity to present different results from different CASE expeditions to a wider audience. We are, therefore, grateful to the Deutsche Gesellschaft für Geowissenschaften for being given the opportunity to publish these contributions. We would also like to thank all authors for submitting manuscripts for both "Arctic" volumes and the reviewers who helped improve the contributions.

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## References

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