

Thematic issue: Onshore-offshore relationships on the North Atlantic Margin

In this thematic issue of NJG we present papers that derive from the 'Onshore-Offshore relationships on the North Atlantic Margin' conference organised by the Geological Society of Norway in Trondheim, 17th–18th October, 2012.

In 2002, a meeting with the same general theme was organised in Trondheim. Since that meeting a lot of new data have been gathered both on- as well as offshore. Also, new concepts that relate field-based geological observations to available offshore geophysical and borehole data have been developed. Thus, ten years later we felt it was time to reconvene and discuss the current state of research on this topic. The North Atlantic margins have traditionally been studied by academics onshore and industry offshore, and the 2012 meeting successfully brought both worlds together.

The 2012 conference covered five different themes: 1) **Margin formation and response of the continent**, 2) **Climatic controls on margin development**, 3) **Deep structure and basement controls on margin evolution**, 4) **Analogue studies of geological processes**, and 5) **Post-Caledonian faulting**. Papers related to all of these different themes are presented in the current thematic issue.

Animated discussions during the conference confirmed that the evolution of the onshore and offshore regions and the relationships between them are still hot research topics and that there are significant gaps in our understanding of these relationships also today. This is maybe most clearly demonstrated by the ongoing debate about the post-Caledonian uplift and erosion history of southern Norway. Despite being located in the North Sea petroleum-industry's backyard, none of the models that have been proposed for the history of vertical movements in southern Norway have so far gained general acceptance amongst geoscientists. Geoscientists with different backgrounds (geologists, geophysicists, numerical modellers and geomorphologists) approach this issue from different angles and will, almost inevitably, oversimplify, misunderstand or ignore some of their colleague's views to some extent. We hope that the 2012 conference and this thematic issue have and will contribute to ongoing

discussions and future research in the North Atlantic realm.

Johannessen et al. and **Olesen et al.** present new data and interpretations that primarily relate to the Mesozoic and Cenozoic evolution of the Norwegian mainland. Low-temperature thermochronology (Johannessen et al.) has been used for more than 20 years now in Scandinavia and with the ever increasing data density it is now possible to get much-improved constraints on fault activity and relate this activity to the regional denudation history. Olesen et al. explore the development of the strandflat and its relationship to deep weathering, the age of which remains a contentious issue for most of the sites where deep weathering is observed. **Sømme et al.** review the onshore-offshore coupling between landscapes and stratigraphy and conclude that the first-order fluctuations in sediment flux can be best explained by tectonic processes. **Indrevær et al.** and **Bastesen et al.** present new data and insights into Caledonian and post-Caledonian structural activity, respectively, with important implications for the later evolution of the Norwegian margin. **Hall** presents a new interpretation of observations on glacial landscapes on Shetland, concluding that ice-cap glaciation has been the dominant mode of glaciation there during the Pleistocene. This paper is a reminder of the importance—and complexity—of careful geomorphological studies in formerly glaciated areas, not least to improve our understanding of the pre-glacial evolution of the North Atlantic margins. **Senger et al.** use onshore and offshore mapping to determine the distribution of igneous complexes of central Spitsbergen and discuss their results in the context of its impact on the potential for CO₂ storage underground.

We thank all authors for their contributions and all reviewers for the time and effort they have invested in this thematic issue.