Geophysical Research Abstracts, Vol. 7, 06971, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06971


# Deformation at the Norwegian Continental Margin

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We study the structural evolution offshore Norway and the resulting consequences on the fate of hydrocarbons. Therefore structural restoration in 2D and 3D structural modelling is used to quantify subsidence and uplift as well as shortening and extension. Based on interpreted seismic data, first results have been obtained from structural restoration of 3 transects running NW-SE from the Norwegian coast to the Voring Marginal High. The transsects cross different structural domains including the basins of Triassic-Jurassic, Cretaceous and Cenozoic age as well as the uplifted highs segmenting theses domains. Section balancing shows that brittle extension of the upper crust is far too small to account for the tectonic subsidence observed at the continental margin and other processes of crustal thinning have to be considered. Furthermore, upper crustal, faulting-induced extension is rather uniform along the margin, but total crustal extension is decreasing from S to N. Major extensional events are indicated for the beginning of the Cretaceous, for the Albian and for the Cretaceous-Tertiary boundary. Post-rift thermal subsidence appears to be the dominating phenomenon in the deep Vøring basins during large parts of the Cretaceous. The transition from Late Cretaceous to Paleocene was characterized by uplift and extension at the westernmost edge of the continental margin, following a late Cretaceous phase of minor shortening. Shortening of some km is observed only in the southern part of the Voring Margin, but not at the Lofoten Margin. The Cenozoic was predominantly a period of passive infilling with only minor faulting and possibly declining thermal subsidence. The structural restorations suggest that the impact of Quaternary glacio-isostatic vertical movements on the rifted margin is minor and has affected only the eastern part of the Trondelag Platform. The 3D structural model integrates data of 5 sedimentary layers (courtesy of Norwegian Petroleum Directorate) and the thickness of the crystalline crust from OBS-data. It images shifting depocentres and shows relationships between subsidence

controlling features and the properties of the deeper crust.