

Previous gravity/magnetic studies

Rockall Studies Group Project 98/1 was undertaken jointly by the British Geological Survey (BGS) and ARK Geophysics Ltd in 1998/9. Gravity and magnetic data from a range of surveys were merged and network adjusted. This included 25000 line kilometres of marine gravity data and 141000 line km of marine and airborne magnetic data, together with results from gravity and aeromagnetic surveys over the Irish mainland. A variety of data transforms and imaging techniques were applied, including the use of colour, shaded relief, continuations and derivatives. The images provide insights into the structural pattern of the region, including evidence of extensive features cutting across the north-easterly trend of the Rockall Basin. Two-dimensional gravity modelling of basin structure was carried out along six seismic profiles near the shelf-breaks. This illustrated that the observed gravity response is dominated by effects due to the marked changes in bathymetry and the related crustal thinning. The modelling nevertheless provided an indication of underlying basement structure along the margins of the Rockall Basin and pointed to inconsistencies in the seismic interpretations of the sedimentary section. Two-dimensional combined gravity/magnetic modelling was also carried out along two regional profiles crossing the full width of the Rockall Basin to address the broader issues of crustal structure. A preliminary three-dimensional, full-crustal model was constructed and the thickness of the cover sequence in this model was optimised to minimise the residual anomalies between calculated and observed free-air gravity responses. This was the forerunner to the Passive Margins Modelling Project, in which the 3D modelling methodology was developed further and applied to the whole NE Atlantic margin (see the accompanying poster).

