Mjølnir, Norway

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Name	Mjølnir
Latitude	N 73° 48'
Longitude	E 29° 40'
Size	20 km
Age	142.0 ± 2.6 Ma

The Mjølnir submarine crater is located in the Barents Sea on the Bjarmeland Platform, a shallow shelf characterized by a relatively undisturbed and complete Carboniferous–Quaternary stratigraphic section. The underlying crystalline basement is assumed to be of Palaeozoic age and is at depths of 7–9 km (Werner and Torsvik 2010).

The impact event affected the almost horizontal stratified sediments to a depth of about 4 km, recognized by disturbed strata in seismic profiles. Indicators for the impact origin of the structure have been found in drill cores and in equivalent layers exposed on Svalbard that are enriched in iridium and shocked quartz (Dypvik et al. 2006; Werner and Torsvik 2010). A central high may have formed a prominent island for a few 100 years after the impact and return of the sea (Dypvik et al. 2003).

The age of the crater is known from biostratigraphy and indicates that the impact event occurred at the Volgian–Ryazanian boundary, around 142 Ma ago (Smelror et al. 2001). Though the crater has been intensively studied, its dimensions at depth are uncertain. Density and magnetic

susceptibility measurements of core samples were recently used to interpret the data of a new aeromagnetic and gravity survey and to model the potential field anomaly data of the area with the aim to constrain better the crater dimension. The results of this work suggest that the crater diameter is about 20 km and thus needs downscaling to about half of the earlier proposed size of about 40 km (Werner and Torsvik 2010).

This is one of the two known submarine craters, only the use of sonar techniques and direct drilling allowed its discovery. Not visible in radar.

References

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