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New aerogravity data for the German Bight (North Sea)

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The Federal Institute of Geosciences and Natural Resources (BGR) is carrying out gravity surveys onboard marine research vessels since the 1960s. Since 1984 these measurements are performed with the KSS31 gravity meter system manufactured by Bodenseewerk Geosystem GmbH. This system has been modified and complemented during the last years to use it for aerogravity surveys as well.

In May 2007 the first aerogravity campaign was carried out with the complete system. Thereby gravity data of the main part of the German exclusive economic zone in the North Sea were obtained. The flights were performed with an Aero Commander 680 LV from the airfield Wilhelmshaven-Mariensiel. During 17 flights 32 northwest-southeast running profiles with a spacing of 5 km and 11 tie profiles with a spacing of 20 and 30 km respectively were surveyed. The total profile length added up to 10500 km. The standard survey altitude was 1000 ft above sea level. Depending on the wind speed and direction the survey velocity ranged between 95 and 115 knots above ground.

In order to get the free air gravity anomalies several reductions to the measured gravity data have to be applied. For this purpose the flight trajectories were determined with high accuracy. Kinematic GPS data of 3 antennae were recorded and combined with the data of an inertial navigation system. One GPS base station was operated at the airfield. Additional base station data were obtained as necessary from the land survey offices of Schleswig-Holstein and Lower Saxony.

Comparative marine gravity measurements were carried out with the same gravity meter system during a BGR cruise with R/V FRANKLIN in June/July 2007.