

Researchers have made quantitative seabed fluid flux calculations using coordinated water column investigations and ROV/HOV observations in several locations including: the Dneper Paleo Delta (McGinnis et al., 2006), the Sorokin Trough (Greinert et al., 2006) and Hydrate Ridge (Heeschen et al., 2003). At the Blake Ridge Diapir-seep (ODP Site 996) researchers have collected water column evidence for bubble ebullition (Paull et al., 1995; this study) and photographic evidence of bubbles (Paull et al., 1995; Van Dover et al., 2003). However only in Van Dover et al.'s (2003) HOV investigation was actual ebullition character observed. To make our flux calculation we selected the Dneper Paleo Delta seeps as a model for Blake Ridge seep flux because ROV and HOV dives in the two areas reported bubbles of the same size and similar rates of seafloor ebullition. We used the minimum seabed flux rate reported by McGinnis et al. (2006) (20.7 mol/day at in-situ pressure) and applied that to 17 years of observed ebullition at the Blake Ridge Diapir. Because of the paucity of observations, we assumed constant flux over that time period.

$$\frac{20.7 \text{ mol}}{\text{day}} \times \frac{365 \text{ days}}{\text{year}} \times 17 = 128,444 \text{ mols of methane}$$

$$\frac{12 \text{ grams Carbon}}{1 \text{ mol}} \times 128,444 \text{ mols} = 1,541,328 \text{ grams of Carbon or 1.54 tons}$$

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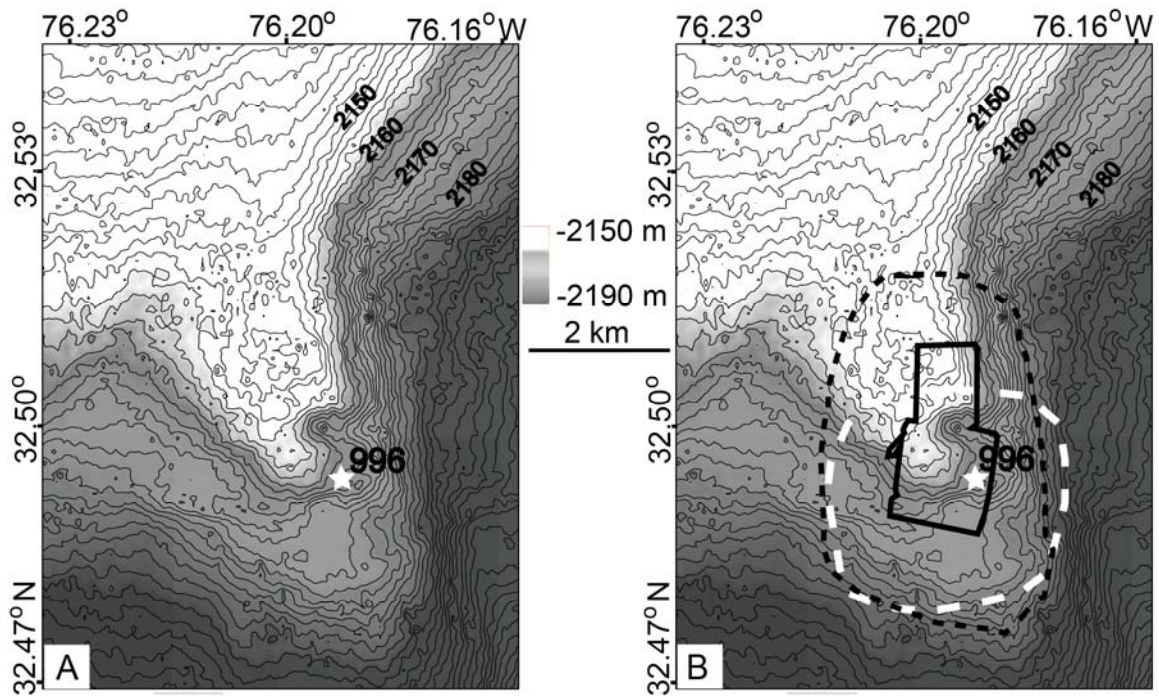


Figure DR1. A. Ship-collected multibeam bathymetry above the Blake Ridge Diapir. Contours are every 2 meters. Red star denotes Ocean Drilling Program Site 996. B. Ship-collected multibeam bathymetry above the Blake Ridge Diapir with Taylor et al.'s (2000) interpreted extent of the Blake Ridge Diapir (white-dashed line) based on two two-channel seismic lines, this study's Sentry survey (black solid line) and our interpretation of seafloor disruption potentially related to the diapir (black-dashed line) super imposed upon it.