

Supplemental Data

A consortium of ExxonMobil Upstream Research Company, IFREMER (Institut Français de Recherche pour l'Exploitation de la Mer) and Total E&P Recherche Développement acquired 2950 km of multi-channel, sparker seismic data (the Sigolo survey) along with high-resolution multi-beam bathymetry over the Golo margin (Savoye, 2008). Seismic reflection data were post-stack time-migrated and have a frequency content that ranges from 130 to 750 Hz with a vertical resolution of two to four meters. Lines were collected on a grid with variable spacing of 800 m to 400 m, with the more closely-spaced lines acquired in the vicinity of the Golo Canyons and the channel to lobe transition of the South Golo Fan.

IFREMER, Total and ExxonMobil then joined with Fugro N.V. to execute a coring program (Golodrill survey). Five cores 65 to 126 meters in length were collected on a shelf-to-basin transect along the South Golo Canyon and Fan. These cores recovered 75-93% of the penetrated section, including significant recovery in sand- and gravel-rich intervals (Jouet, 2018). As described by Jouet (2009) and Sweet et al. (2020), cores were described and analyzed for total natural gamma radioactivity, particle size, oxygen and carbon isotopes, and calcium carbonate content from benthic and pelagic foraminifera, and were sampled for OSL and ^{14}C dating. OSL methods focused on the sand fraction whereas ^{14}C was used on fossil fragments from mud-rich intervals. The two methods provide results that are consistent with each other. OSL has rarely been used to date deep water sediments. It can provide chronological control over the last 200 kyrs (Rhodes, 2011) and therefore fills a critical time gap beyond the ~50 kyr limits of ^{14}C . Distinctive carbonate-rich muds, or marls, also occur in these cores and can be traced as marker beds throughout the basin in seismic data. For the pre-MIS 5 record, age estimates for marls are based on correlation between $\delta^{18}\text{O}$ from Golo sediments and global $\delta^{18}\text{O}$ curves.

Cores GDEC 4, 6, and 8 were collected from slope, channel-levee, and South Golo Fan environments, respectively (Figures 1 and 2), and are tied to seismic data using Petrel™ seismic interpretation software.

REFERENCES CITED

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