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The first record of Pliocene-Pleistocene dysoxic benthic foraminiferal assemblages in the Bering Sea: Initial results from IODP Expedition 323

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The primary objective of drilling at Site U1341 was to study high-resolution Pliocene–Pleistocene paleoceanography in the southern part of the Bering Sea at a western flank location of Bowers Ridge. Previous DSDP coring (Site 188) and subsequent piston core studies in the region documented high sedimentation rates of 100–138 m/m.y., and the presence of appropriate microfossils for paleoceanographic studies.
Drilling at Site U1341 —located at a water depth of 2177 m recovered nearly 600 m of diatomaceous sediment, and provides a record of past intermediate water conditions in the Bering Sea. The site is located just below the modern OMZ, which causes the formation of laminated sediments. Fluctuations in the intensity or depth of the OMZ should be captured by benthic foraminiferal proxy records of past oxygenation measured at this site and compared to shallower sites.
We present the first record of benthic foraminiferal assemblages from 110 samples collected at 3 m resolution in IODP Hole 1341B. Pliocene assemblages from the base of the hole to ∼320 m consist entirely of agglutinated foraminifera strongly dominated by the infaunal genera Eggerella, Karreriella, and Martinotiella. The ecological information gained from this assemblage supports other proxy information indicating high levels of organic productivity in the Bering Sea. Occasional horizons with calcareous benthic foraminifera dominated by buliminids are present, possibly owing to fluctuations in the CCD.
Calcareous benthic foraminifers (mostly comprised of Bulimina, Globobulimina, Uvigerina, Melonis, nodosariids) show improved preservation in the upper part Hole 1341B starting at ∼320 m (ca. 2.3 ma). This level coincides with abundant sea ice diatoms and radiolarians living in cold and oxygen-rich intermediate water masses. The fauna still indicates dysaerobic conditions, but productivity may have been reduced by seasonal sea ice coverage and an enhanced stratification of the water masses. The preservation and diversity improves again at ∼150 m (ca. 1.1 ma), close to the “mid-Pleistocene transition”.