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# Organic matter mineralization in the deep subseafloor sediment of the northeastern Bering Sea Slope (IODP Exp. 323)

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IODP Expedition 323 to the Bering Sea 2009 studied among others microbial mediated diagenetic processes in subseafloor sediments. Three sites at water depths of 1020 to 3220 m, situated in the high productivity "Green Belt" region were studied. A drilling depth of >700m combined with high-resolution sampling in the top 36 m allowed for a detailed description of the porewater chemistry and modelling of carbon transformation rates. Our Bering Sea results show that intense organic carbon mineralization drives high ammonium and dissolved inorganic carbon (DIC) production rates (> 4.2 mmol m-3 y-1) in the uppermost 10 mbsf. DIC and NH4+ production in this zone constitute more than 85% of the total depth integrated activity. Rates of organic carbon mineralization decrease significantly with depth and at 150 mbsf the activity is 3 orders of magnitude lower than the activity in the uppermost 10 m. Organic matter mineralization and anaerobic oxidation of methane (AOM) strongly imprint the stable carbon isotope composition of DIC, driving it to a minimum value of -27 ‰ (VPDB) at the sulfate methane transition zone (SMTZ) . Below the SMTZ, methanogenesis results in 13C-enrichment of pore-water DIC, with a maximum value of +11.9 ‰The imprint of methanogenesis on the DIC carbon isotope composition is evident down to a depth of 150 mbsf. Below this depth, slow or absent microbially mediated carbon mineralization leaves DIC isotope composition unaffected.