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A low-activity cold seep in the Larsen B area, western Weddell Sea, Antarctica

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An Antarctic cold seep ecosystem was recently discovered in the Larsen B area, eastern Weddell Sea (Domack et al., 2005). Within the framework of the R/V Polarstern expedition ANTXXIII-8, we revisited this area for videographic and geochemical examinations. During two dives with ROV Cherokee (Marum, Bremen), several bivalve shell agglomerations of the seep-related, symbiotic clam *Calyptogena* sp. were found in the trough of the Crane and Evans glacier. The absence of living clam specimens indicate that the flux of sulphide and hence the seep activity is diminished at present. This impression was further substantiated by our geochemical observations. Concentrations of thermogenic and/or hydrothermal methane were moderately elevated with 2 μM in surface sediments of a clam patch and increased up to 9 μM at a sediment depth of about 1 m in the bottom sections of the sediment cores. This correlated with a moderate decrease in sulphate down to 23.4 mM and an increase in sulphide up to 0.55 mM. Furthermore, elevated rates of the anaerobic oxidation of methane (AOM) of about 600 pmol cm^{-3} d^{-1} mediated by anaerobic methanotrophic archaea related to ANME-3 and ANME-N were detected at a sediment depth of 1 m. Based on the

geochemical data set, a numerical model approach showed that the seep activity which supported populations of *Calyptogena* sp ended several hundred years ago.

(Domack et al. 2005, EOS 86, 269–276)