Methane transport to the ocean from the Mid-Atlantic Ridge, 7°S to 11°S

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During METEOR Cruise 62/5, we observed pronounced methane anomalies on the Mid-Atlantic Ridge between 8°10'S and 8°20'S. Initial results of carbon isotope measurements indicate that the methane anomaly on the inside corner of the rift valley at 8°18'S has a heavy $^{13}C/^{12}C$ ratio ($\delta^{13}C$ = -14‰) that is indicative of "abiogenic" generation. Our objective in the second phase of the SPP is to conduct an extensive survey of dissolved methane in this region in conjunction with that of $^{3}He/^{4}He$ ratio measured at the University of Bremen. We plan to carry out this survey on METEOR Cruise 68/1 scheduled in April, 2006. In addition, we will determine the distribution of the methane $^{13}C/^{12}C$ ratio in this region through isotopic measurements on gas samples extracted during this expedition. Additional related objectives include the determination of dissolved hydrogen concentration associated with the methane plumes, the ratio of higher hydrocarbon to methane concentration, and the determination of hydrogen isotope ratios in high concentration plumes/vent sources. The overall aim of the project is to improve the estimate of methane fluxes from Mid-Ocean Ridge systems as well as to constrain the origin of the volatiles using tracer/tracer correlations.