

GLOBAL WARMING IMPACTS THE GEOCHEMISTRY OF SHALLOW MARINE SEDIMENTS OF THE BALTIC SEA

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Abstract

Global warming and its impacts are among the main concerns of our society. Effective action to tackle climate change problems need to be based on the best scientific knowledge available. However, if on one hand anthropogenic effects on global warming is unequivocal; the impacts are fairly less grounded and particularly in less accessible marine environments. Here we present preliminary results of a study based on coring campaigns in the Hamnefjärden area, Baltic Sea, which contains a warmed bay (artificially heated by the discharge of hot water from a power plant since the 1970's) and a cooler, unaffected control bay. The warm bay is used as analog to unravel possible future alterations in the marine environment related to climate change. Preliminary results suggest that anaerobic oxidation of organic compounds is strongly influenced by temperature and the related depth of sulfate reduction (and sulfate -methane interface) is significantly reduced in the warmer bay compared to the control bay. These results are consistent with laboratory experiments simulating warming of bottom waters in sediment cores obtained in the same areas, and indicate that reduced and toxic substances such hydrogen sulfide (and methane) will be formed at shallower depths below to the seafloor with potential impacts for benthic life in the already fragile environment of the Baltic Sea.

Keywords: climate change, geochemistry, Baltic Sea.