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Simulation of the advective methane transport and AOM in Shenhu area, the Northern South China Sea

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Anaerobic Oxidation of Methane (AOM) occurs in the transition zone between the presence of sulfate and methane. This reaction is an important process for methane and the global carbon cycle. Methane gas hydrates bearing sediments were recovered in Shenhu Area, the Northern South China Sea, and methane advective transport was detected in this area as well. A one dimension numerical simulation tool was implemented to study the AOM process combined with the advective methane transport in Shenhu Area according to the local drilling data and geochemical information. The modeled results suggest that local methane flux will be consumed in the sediment column via dissolution, sorption and AOM reaction. A portion of methane will enter water column and possibly atmosphere if the methane flux was one order of magnitude higher than current level. Furthermore, the calculated rates of AOM in Shenhu area range similar to that of gas hydrate mounds in Mexico Golf. However, AOM is ability to consume more methane than that in Golf of Mexico due to the lower permeable sediment associated with a deeper sulfate methane transition layer.