

Porewater geochemistry and 3D characterization of seep-affected sediments in the Levant Basin (eastern Mediterranean, offshore Israel)

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The aim of this MSc project is to unravel the impact of methane seepage on Holocene sediments in the Levant Basin (Eastern Mediterranean Sea, offshore Israel). Within the framework of the EU-funded SEMSEEP project, 10 different sites in the Levant Basin were sampled. The sediment-water interface and uppermost Holocene sediments were collected through boxcoring. Porewaters have been extracted from the sampled sediment cores and subcores have been taken from each boxcore for further analyses. To understand the potential impact of methane seepage within these areas, porewater geochemistry and detailed X-ray computed tomographic scanning of the subcores has been performed. Porewaters were analysed for chloride and sulphate concentrations, total alkalinity, methane, DIC, Ca^{2+} , Mg^{2+} , Na^+ , K^+ , and $\delta^{13}\text{C}$ of the DIC to obtain a coherent geochemical dataset. Subcores were scanned using high-resolution 3D X-ray micro-tomography to visualize the sedimentary facies, to describe qualitatively and quantitatively bioturbation and to identify authigenic carbonate crusts in the core sections. Pore water geochemistry and sedimentary CT-facies were studied to evaluate the influence of methane seepage at the 10 sites. Especially the potential link between active methane seepage, seep carbonate precipitation and bioturbation within seep-affected sediments has been explored. This study evidence 4 recent methane seepage locations and 6 inactive methane seepage locations within the 10 investigated locations.

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