

Submarine pockmarks area localization using in-situ radio-tracing technique in Eckernförde bay, Germany*

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Eckernförde Bay is a narrow bay (“Förde” in German or “Fjord” in Danish) of 16 km length and 2–6 km wide situated on the east coast of Schleswig-Holstein (northern Germany) in the south-western Baltic Sea. For the scientific community, noteworthy aspects of the bay concerns the extensive methane production in sediment and the presence of pockmarks areas. Pockmarks are morphological seafloor’s depressions (craters) of atypical shapes with depth of 1-2 m which in numbers form pockmarks areas. The main pockmarks areas are located in the centre of the bay and along the south bank. Interstitial fluids of the sediments in the pockmarks contain very low or undetectable methane concentrations so, methane production does not involve in creation neither in maintenance of the pockmarks. The pockmarks of the bay are submarine springs of non-continuous but rather episodic groundwater emanation. Groundwater is rich in natural radionuclides and especially in radon gas. The aim of the present work was to assess the possibility of pockmarks localization by radio-tracing method based on spatial variations of radon progeny (bismuth ²¹⁴Bi) and natural radioisotope of potassium (⁴⁰K) as well as, to provide an estimation of radon activity concentration in the emanating groundwater flows.

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