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Geochemical prospecting of raw hydrocarbons in the system: continental margin – the Arctic Ocean floor

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Geological and geochemical mapping of the Russian polar sector of the Arctic Region (AO) (in scale 1:1 000 000 and 1:2 500 000) shows that in addition to well-known oil and gas areas in the land-sea system, continental rifts transiting to the shelf area of the Barents, Kara, Laptev and other seas may be promising for raw HC (Fig. 1) as well as some basins (Podvodnikov, for example) of the deep-sea bed of AO. Above buried zones of such rifts in AO, geochemical anomalies of methane and other HC are recorded (Fig. 1). In the Kara Sea, it is the continuation of Urengoi rift providing the input of abiogenic HC to the north of West Siberia oil and gas province (Fig. 1).

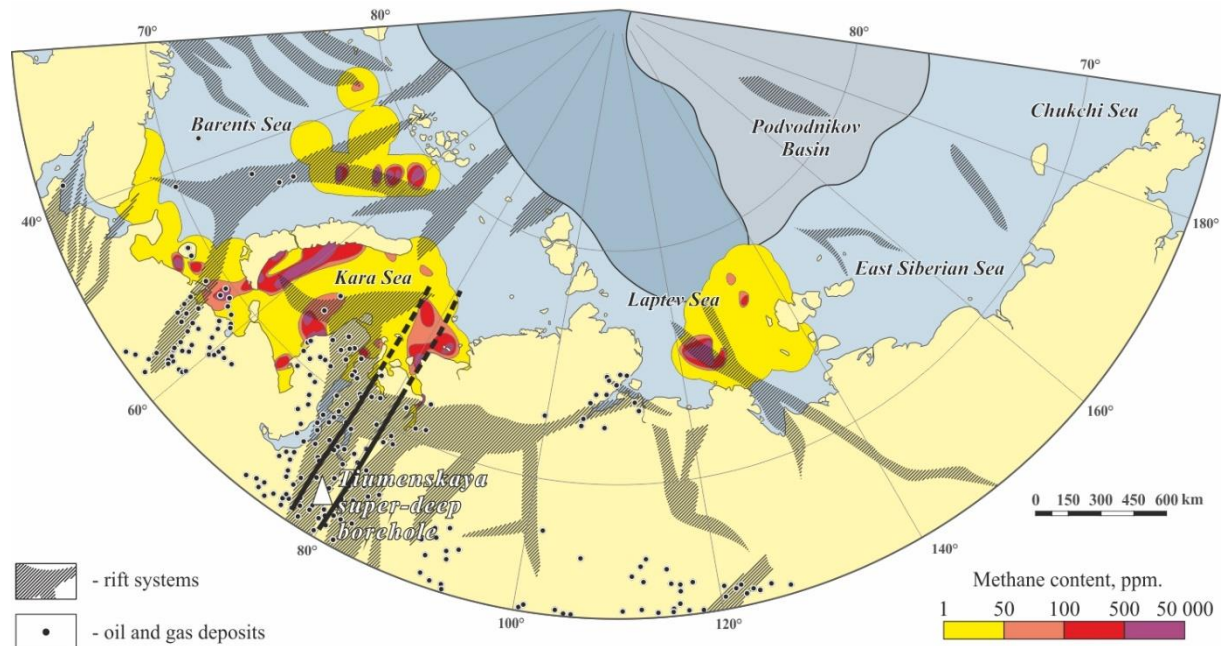
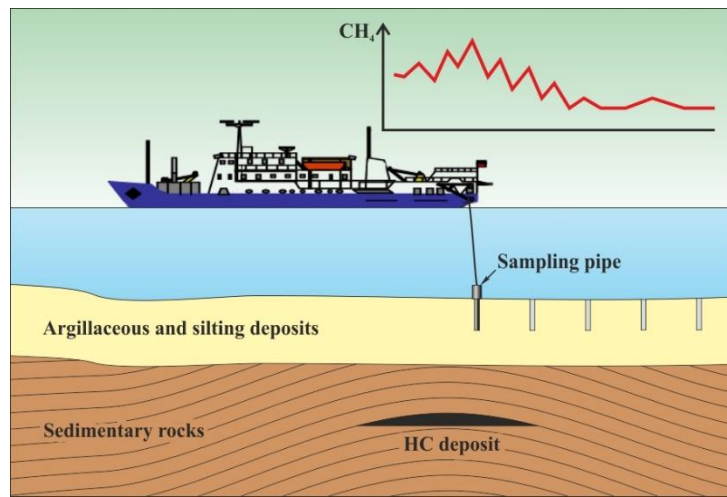


Figure 1: The chart of location of transcontinental rifts in the land – sea system of the Arctic Ocean with accompanying HC deposits and anomalous geochemical fields of methane.

The buried rift in the base of sedimentary basin is recorded by the combination of linear zones of magnetic field gravity lows and highs (zone of the ocean floor extension with synchronous mantle magmatism) with areas of local bathymetric rises (above-arch structure in the sedimentary cover).

The model was elaborated of HC migration above deeply buried



deposits and efficient complex of methods was developed to record sorption forms of light and aromatic HC in land. We recommend that revealing geochemical anomalies should be conducted by sampling bed silts with sample pipes (Figure 2) and by analyzing them for HC with the use of gas chromatographs and MIS sensors to determine the content of H_2 , H_2S , NO_2 and other gases.

Figure 2.: The scheme of the ocean floor loose sediments sampling for HC analysis

