



## **Thermal regimes and hydrodynamics defines oil and gas potentials in the Volga region**

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The evaluation of oil and gas potentials in the region has been conducted using the method of hydrocarbon exploration based upon the temperature survey. The method is employed for studying the major fields in the earth's crust, represented by the gradients of temperature, pressure and concentration, which define the migration paths of fluids and, thus, the hydrocarbon accumulation. Being combined with the other available techniques, this method permits the determination of certain criteria for the local and regional oil and gas location. The correlation of the isotherms with the known oil and gas areas has shown that the highest concentration of oil fields in the areas containing impermeable rocks is mostly confined to temperature minima, while that in the areas containing permeable rocks is associated with temperature and thermogradient maxima. The Volga-Ural region is mostly made up of permeable rocks. The major agent of hydrocarbon accumulation here is a pressure gradient (filtration), and the oil fields are confined to high-temperature zones. As a result of oil displacement, oil pools are formed in the zones of an upward movement of water through the strata. The correlation analysis of the data from various parts of the world shows that 99 percent of oil pools are confined to the buried zones of water discharge. The temperature map and thermogradients throughout the studied section have prompted the conclusions outlined below. Hydrocarbons migration path runs from the major feed area of the Volga-Ural province (Timan, Tokmovsky, Komi-Perm arches) towards the largest discharge zone within the Caspian trough. The migration channel is made up of the north-south trough system consisting of the Kazan-Kazhim, Melekes and Caspian troughs. The recorded temperature field clearly shows the discharge zones featured by the high geothermal parameters due to an upward fluid movement that warms up the rocks. Oil pools are rarely found in the infiltration zones.