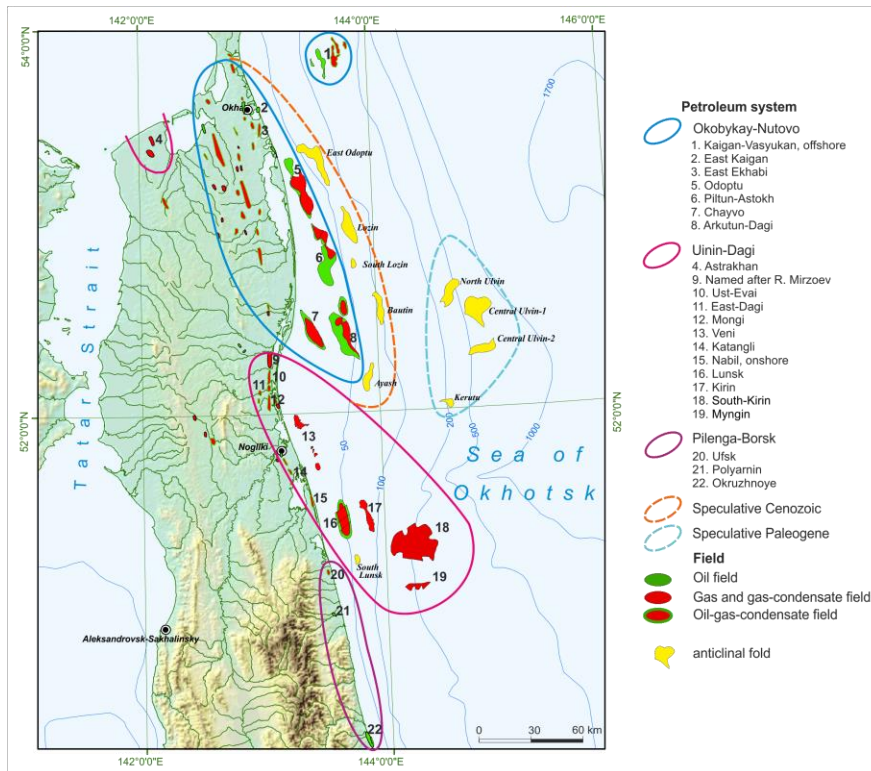# Paper Number: 2663

New technologies for Petroleum systems exploration and geological risks minimization

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North Sakhalin is the significant oil-and-gas production area in Russia. At the end of XX − beginning of the XXI centuries it became a major center of oil and gas production from the reserves of large and unique fields offshore northeast of the Sakhalin Island. As of today, some fields have been discovered here. HCs are being extracted from several fields under Sakhalin-1, Sakhalin-2 and Sakhalin-3. In 2015, 16.7 million tons of oil and 28.1 billion m3 of gas were produced in Sakhalin. Liquefied Natural Gas (LNG) Plant gave 10.8 million tons of LNG under Sakhalin-2 project. In 2016, it is planned to keep oil production rates on the same level and increase gas extraction to 30.4 billion m3 by way of introducing Arkutun-Dagi field (Sakhalin-1) in production chain and raising the output of the Kirin field.

Offshore fields are confined to geographically separated Okobykai-Nutovo (Mid-Upper Miocene) and Uinin-Dagi (Lower-Mid Miocene) petroleum systems (Fig. 1) which can be also tracked down within the island. Pilenga-Borsk petroleum system in the offshore areas is poorly studied.

Sakhalin shelf has high petroleum potential. Within Sakhalin-3 block, three major structures East Odoptu, Bautin and Lozin were identified.

Figure 1: Petroleum systems layout

The generated paleofacies models of the shelf ensure high chances to identify lithologic traps in Paleoamur deltaic system. Porous reservoir rocks may be present in deep subaqueous fans outside the deltaic system. Fractured-porous reservoir rocks in siliceous rocks (silicites) may be view as an accompanying target.

Prediction of reservoir rocks presence in the outer shelf of the island and on the slope is a nowadays challenge. Integrated and comprehensive study using the state-of-art technologies is required to optimize the ways of evaluation of hydrocarbon potential in the sedimentary basins. Prior to making a decision to carry out an expensive 3D survey, and in order to reduce the risks at the well drilling stage, it is more efficient to apply new processing technologies of geophysical data; further they will be the basis for reinterpretation of the acquired data and specification of subsoil setting models.