

## **The Geological Structure and Hydrocarbon Potential of East Barents Sea Region: from Overview and Comparison to the Norwegian Barents**

**Verzhbitsky, Vladimir<sup>1</sup>; Taylor, Kelvin J.<sup>2</sup> (1) TGS-NOPEC Geophysical Company Moscow, Moscow, Russia. (2) TGS-NOPEC Geophysical Company, Geological Products and Services, Stavanger, Norway.**

Here we present the synthesis of available/published geological and geophysical data on Barents Sea region, including TGS/NGP seismic data (2005) and TGS/VBPR Geophysical Atlas of Barents Sea (2004). The Barents Sea region is one of the most hydrocarbon-rich sectors of the Arctic shelf, with well-known oil, gas-condensate and gas fields in both the Norwegian (Snøhvit, Goliat) and Russian sectors (Shtokman (one of the largest discoveries in the world), Ledovoe, Ludlov). While discoveries have been made within most of structural elements in the Norwegian sector, the majority of the fields and potential structures in the Russian sector are localized within the prominent NNE-trending East Barents rift (trough), filled by up to 18-20 km thick Late(?) Paleozoic - Mesozoic sequences. The trough is traced to the west from Pay-Khoy - Novaya Zemlya Early Kimmerian fold belt (and its' foredeep) and consists of two different sedimentary basins (Southeast and Northeast), separated by Ludlov Saddle. It is proposed, that the Khibiny-Kontozero extensional fault zone on the Kola Peninsula, with most extensive alkaline magmatism event in the Late Devonian (timing of rifting initiation?), ~360-380 Ma (Sharkov, 2002), represents the SW onshore propagation of East Barents rift (Baluev, 2006). This would coincide with the initiation of structural development in the Norwegian sector, where Late Devonian to Early Carboniferous extension created a series of narrow NE-SW trending rift basins (e.g. Nordkapp Basin). Major subsidence of the East Barents trough took place during Late Permian and, mostly, Triassic, accompanied by voluminous terrigenous sedimentation (Shipilov, Tarasov, 1998). Similar subsidence occurred in the Norwegian sector, allowing upwards of 3000m of Triassic sediments to be deposited on the platform areas alone. The timing of magmatic events in Russian and Norwegian sectors is also discussed. Unlike the variety traps seen in the discoveries of the Norwegian sector, the main hydrocarbon accumulations in the East Barents trough are all related to the gently folded Triassic, Jurassic and to a lesser extent, Cretaceous units. The origin of these fold structures is still controversial. One of the points of view is that the formation of the contractional domes was caused by far-field effect of Paleogene right-lateral transpressional movements between Greenland and Svalbard during opening of Norwegian-Greenland sector of North Atlantic (Geophysical Atlas..., 2004).