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The Class@Baikal project: studying recent tectonics, sedimentology and geochemistry on Lake Baikal

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The Class@aikal project – onboard training of the marine science students on the Baikal Lake – is successfully running for the second year following and carrying further the traditions laid out by the legendary UNESCO Training-through-Research (Floating University) Programme.
Main areas studied during two Class@Baikal cruises are:
“Bolshoy Mud Volcano” is located at the southern deep of the lake. Dense profiler lines grid has been acquired during the Class@Baikal-2015 expedition. A sedimentary core with mud breccia and massive gas hydrates was collected from the southern crater confirming its active status.
“Krasny Yar seeps” are located within outer delta of the Selenga River. Side-scan sonar, profiler and multibeam data show that there is a well-expressed amphitheatre-shaped slump scour nearby. Slumped sediments and associated amphitheater scour were mapped. Data indicated that the seabed scour has steep walls. Propagation of the slumped sediments had been stopped by a seabed ridge of unknown origin. At the north the ridge is breached and the slumped material funnels out through a narrow opening spreading down the slope by gravity flows.
“Novosibirsk” and “St.Petersburg mud volcanoes” are located along a fault. The mud volcanoes are located partially along its hanging wall and partially along its foot wall. Side-scan sonar and profiler data acquired during Class@Baikal-2015 expedition show that both mud volcanoes demonstrate evidence of a vertical material transport within feeder channels, which developed on both sides of the fault. The fault seems to be separating the mud volcano area into clusters. It is proposed that initially the fault did not have vertical offset but nevertheless initiated mud volcanic activity. The early mud volcanoes had usual symmetric morphology. The vertical offset of the fault took place later and this resulted in formation of the blocky asymmetry of the structures.
“Khuray deep-water depositional system” study has begun in 2014 when a modern canyon-like erosional valley dissecting a large fault block at the bottom of Baikal near Olkhon Island was surveyed. Clastic material is gathered from the flanks of the central Baikal deep and then transported by gravity flows for considerable distance to the northeast where it is deposited with terminal lobes. The transit part of the system is confined by the step flanks of the deep from the northwest and by extensive fault block from the southeast. Preliminary analysis of the data allows to identify three major facies zones which follow each other along the main clastic transport direction. At the proximal part the seabed is dominated by a system of multiple small unconfined channels without a preferred direction. Downslope this zone is followed by a system of two relatively large channels running in sub-parallel direction. These channels merge into one in the next downdip zone adjacent to the canyon-like valley.
“Slide of Kukuy Griva (ridge)” were surveyed and for the first time sampled during Class@Baikal-2014 expedition. The data provided new insights on the morphology of the slope of Kukuy Griva and on Quaternary history of mass transport in the area.