



SEISMIC EVIDENCE OF SMALL-SCALE LACUSTRINE DRIFTS IN LAKE BAIKAL (RUSSIA)

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High resolution, single-channel seismic sparker profiles across the Akademichesky Ridge, an intra-basin structural high in Lake Baikal (Russia), reveal the presence of small sediment mounds and intervening moats in the upper part of the sedimentary cover. Such features interrupt the generally uniform and even acoustic facies and are not consistent with the hemipelagic sedimentation expected on such an isolated high, which would produce a uniform sediment drape over bottom irregularities. The influence of turbidity currents is excluded since the ridge is an isolated high, elevated more than 600-1000 m above adjacent basins. The mounded seismic facies includes migrating sediment waves and non-depositional/erosional incisions that strongly suggest sediment accumulation was controlled by bottom-current activity. We interpret the mounds as small-scale (few tens of km² in area) lacustrine drifts. Four basic types of geometry are identified: 1) slope-plastered patch sheets; 2) patch drifts; 3) confined drifts; 4) fault-controlled drifts. The general asymmetry in the sedimentary cover of the ridge, showing thicker deposits on the NW flank, and the common location of patch drifts on the northeast side of small basement knolls, indicate that deposition preferentially took place on the lee sides of obstacles to a current flowing northward or sub-parallel to the main contours. Deep-water circulation in the ridge area is not known in detail, but there are indications that relatively cold saline water masses are presently flowing out of the Central Basin and plunging into the deep parts of the North Basin across the ridge, a process that appears to be driven mainly by small differences in salinity. We infer that the process responsible for the observed bottom-current-controlled sedimentary features has to be sought in these large-scale water-mass movements and their past equivalents. The

age of the onset of the bottom-current-controlled sedimentation, based on an average sedimentation rate of 4.0 cm/ky, is roughly estimated to be at least 3.5 Ma, which is generally regarded as the age of the onset of the last major tectonic pulse of rift basin development in the Baikal region.

References

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