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Recent History of Sediment Dynamics in Lake Toro and Applicability of ^{210}Pb Dating in a Highly Disturbed Catchment in Northern Japan[1]

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ABSTRACT

Sediment dynamics for the last 300 years in Lake Toro and the applicability of ^{210}Pb dating (CIC and CRS models) are evaluated. The lake sedimentation and sediment yield were determined by ^{137}Cs (in 1963) and two tephra layers (Ko-c2 in 1694 and Ta-a in 1739). The average sediment yields for initial development periods of catchments were 13.0-14.1 t km^{-2} yr^{-1} until 1963 and increased to 30.5 t km^{-2} yr^{-1} after 1963 because of the conversion of floodplain and upland forests to cultivated lands. In particular, the western zone of the lake near the conjunction with the Kushiro River had a high sedimentation rate, which is attributable to sediment inflow back from the Kushiro River during floods. The CIC model was not applicable because of fluctuations in the ^{210}Pb profiles since 1963. The CRS model agrees with the ^{137}Cs dating in all sites except for one site close to the Kushiro River inflow. ^{210}Pb dating may contain considerable errors where the ^{210}Pb concentration profile and flux are perturbed by floodwater from the Kushiro River, which contains low levels of ^{210}Pb.

Keywords : *Lake sedimentation, Sediment yield, ^{210}Pb dating, ^{137}Cs dating, Kushiro Mire*

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