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^{210}Pb as an indicator of changing accumulation conditions on lowland floodplains

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Airborne ^{210}Pb is commonly used as a natural tracer to establish chronologies or to estimate deposition rates in various environments. Its use for floodplain deposits encounters, however, some limitations and difficulties related to significant spatio-temporal variability of ^{210}Pb fluxes to the floodplain. ^{210}Pb in an overbank sediment column originates from three sources: *in situ* production, atmospheric fallout and potentially highly variable flood-related inputs from the catchment. Evaluation of the last component allows for estimation of the averaged accumulation rates on the floodplain for last 100 years. Absolute values of accumulation rates may be subject to substantial systematic uncertainties but at least they provide a picture of relative variability of accumulation rates on the floodplain.

Floodplain depth profiles of ^{210}Pb activity themselves can provide additional information on past and present patterns of sediment transport and accumulation in the fluvial system, especially if other natural tracers (e. g. heavy metals, ^{137}Cs, ^{228}Ra/^{226}Ra) are used simultaneously. Examples of ^{210}Pb based accumulation rates and ^{210}Pb profiles from three lowland rivers are presented. Estimates obtained for the floodplain of the Warta River show a consistent picture of the accumulation rates decreasing with the distance from river channel. Shapes of ^{210}Pb profiles are irregular in the natural levee and become monotonous at locations more distant from the channel. Interpretation of these patterns is more valuable when other tracers and sediment properties are considered. For example, peaks of ^{210}Pb activity can be attributed to single flood events of great scale. A ^{210}Pb profile from the Pisia River floodplain can be divided into three parts corresponding to periods of overbank accumulation, pond accumulation and the transitional period.

Multitracer approach applied to floodplain deposits allows for reconstruction of changes in sources of the accumulated material, sedimentation patterns and other catchment scale processes which occur under anthropogenic influences such as land use changes and global climate change.

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