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PALEOGEOGRAPHICAL INTERPRETATION OF PALEOCHANNEL FILL IN THE BIEBRZA RIVER VALLEY AT LIPOWO SITE (NE POLAND)

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Study area is located in NE part of Poland in middle Biebrza Basin. Relief of this region formed during Middle Polish (Saalian) Glaciation – Wartha Glaciation. However during the next ice-sheet advance until the Pomeranian phase of last glaciation (15,5–15,0 ka BP [8]; 16,2 ka BP [5]) outflow from Naroch-Wilia and Skidel the dam lakes and river waters of the upper Neman river followed Łososna river valley, its tributary Tatarka river breakthrough Pripilin-Nurki gap section to Biebrza and Narew river valleys [1, 8, 9]. Therefore the Biebrza is underfit river with vast peat-bogs on its valley floor. The Pleistocene relief of the valley was transformed in small degree during the Late Glacial and Holocene. In this period controling factors of the evolution were climate and vegetation changes [3].

Geological, geomorphological and geoarchaeological studies were conducted at the Lipowo site in one excavation season in 2016. A beginning of peat accumulation in the valley floor was radiocarbon dated at 8490 ± 80 BP (MKL-3275) 7658–7347 cal. BC. At the similar time was cut off Biebrza river channel near a sandy elevation. Cone from the silty sands in the bottom of this abandoned channel was radiocarbon dated at 8330 ± 120 BP (MKL-3277) 7577–7083 cal. BC. Both these occurrences, a rise of ground water level and channel change, could be connected with climatic changes – cool and humid phase at the beginning of Atlantic. This event is globally known as 8,2 ka event [7] have been indicated also in Centraleuropean valleys as a phase of an increase fluvial activity [1]. Gyttja with water malacofauna was accumulated in oxbow lake during the Early Atlantic. Lake had disappeared about 6170 ± 80 BP (MKL-3276) 5313–4911 cal. BC when started accumulation of peats and developed peat bog here.

At Lipowo site artefacts of the Niemen culture were found. Single flint artefacts remain in the analogous stratigraphic position as at Krasnoborki site. An trench 1 single flint artifacts and animal bones (profile E) occurred. An trench 2 (profile N) concentration of flint artifacts with cremated fish bones and animal bones (large mammal, probably moose) was found. However, at trench 4 on the top of the elevated form were also exposed single fragments of pottery. It may be linked to the settlement function of the Lipowo site.

Results of studies at Lipowo and other sites in Biebrza river valley floor indicate some periods of climatic changes and an increase of morphogenetic processes activity. The oldest phase of cool and humid climate was dated at beginning of Atlantic (growth of peat bogs in valley floor, river channel cut off). Next humid period in the end of the Atlantic indicated subfossil trees (trees couldn't growth on a peat-bog in the valley bottom). The youngest humid period and beginning of peat accumulation on Subboreal colluvia (delluvia) occurred about 3200–3100 BP (Krasnoborki site) [4].

Climate fluctuations correlate very well with phases distinguished in Centraleuropean river valleys [1]. Traces of the Subboreal soil erosion and colluvial (delluvial) covers formation occurred on the slope elevation (Krasnoborki) [4]. Artefacts at Lipowo were found in the same type of sediments.

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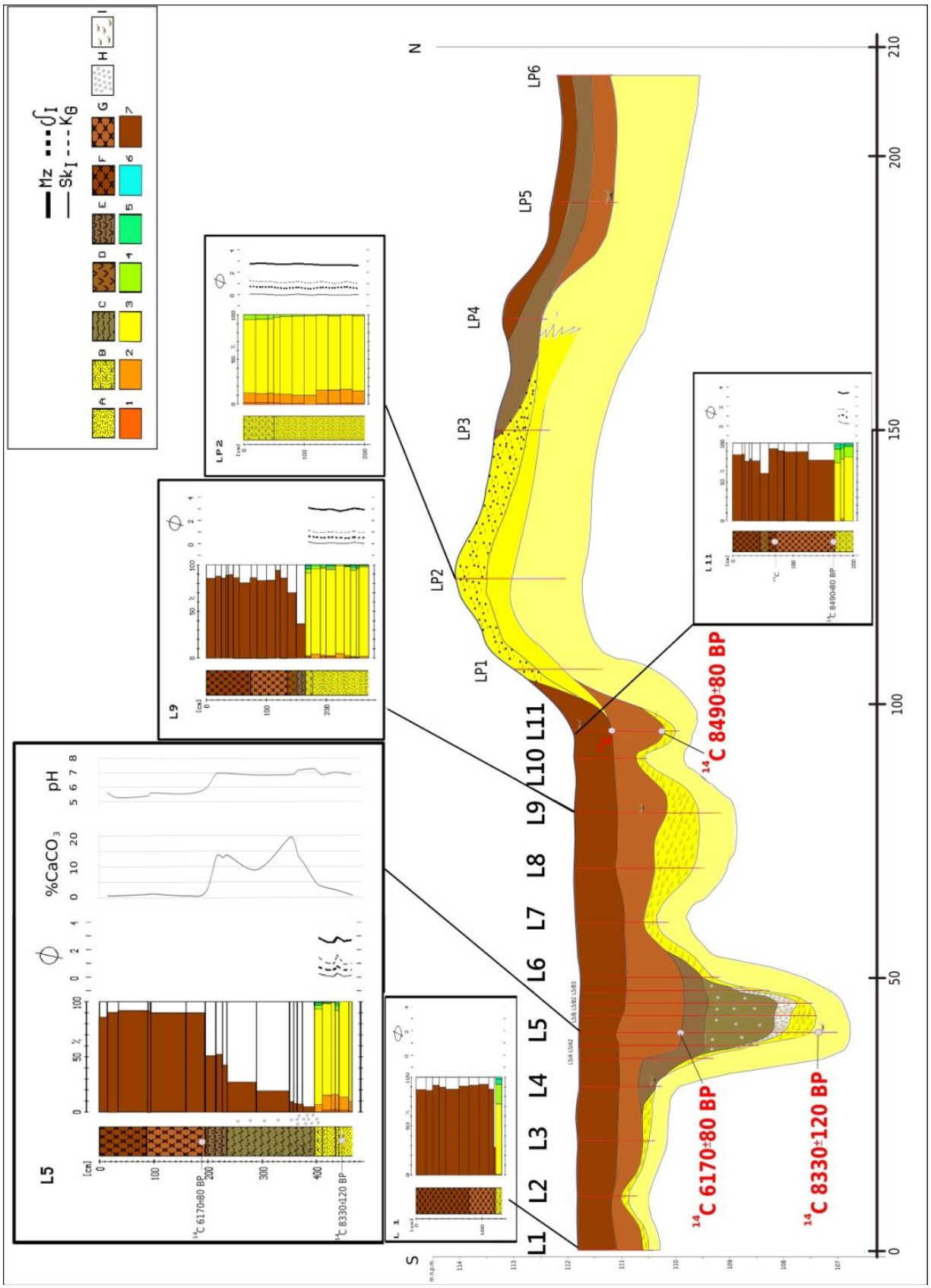

Figure 1 – Geological cross-section of Lipowo site (description like Fig. 2.)

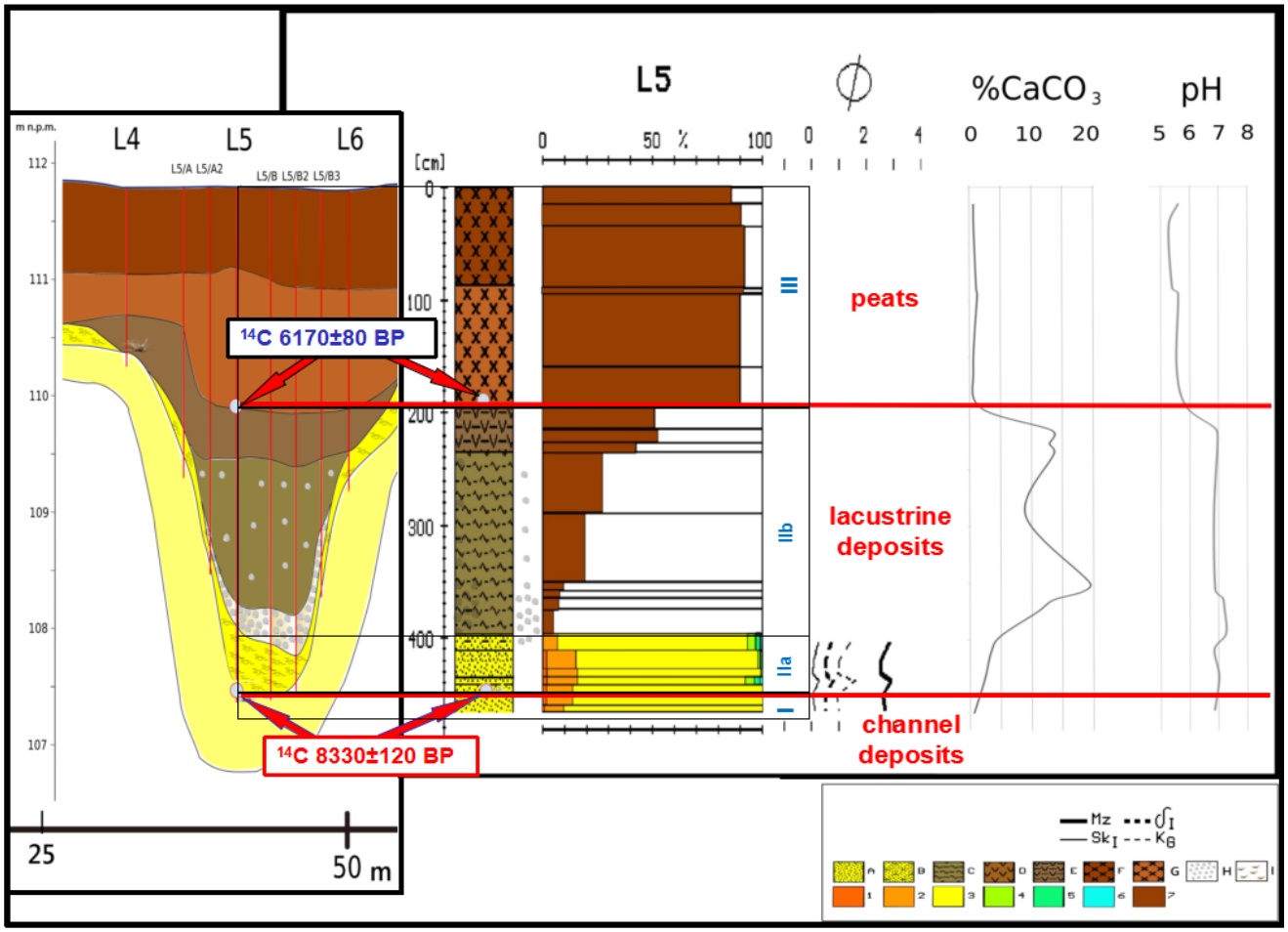

Figure 2 – Paleochannel fill, lithology, grain size and Falk-Ward distribution parameters of L5 profile
Lithology: A – fine-grained sands, B – silty sands, C – gyttja silts, D – peaty silts, E – silty peats, F – peats, G – peats (undecomposed), H – molluscs, I – subfosil wood; Fractions: 1 – coarse sand (-1 to 1ϕ), 2 – medium sand (1–2ϕ), 3 – fine sand (2–4ϕ), 4 – coarse and medium silt (4–6ϕ), 5 – fine silt (6–8ϕ), 6 – clay (above 8ϕ), 7 – organic matherial; Folk-Ward's distribution parameters: Mz – mean diameter, δ_I – standard deviation (storting), Sk_I – skeweness, K_G – kurtosis

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