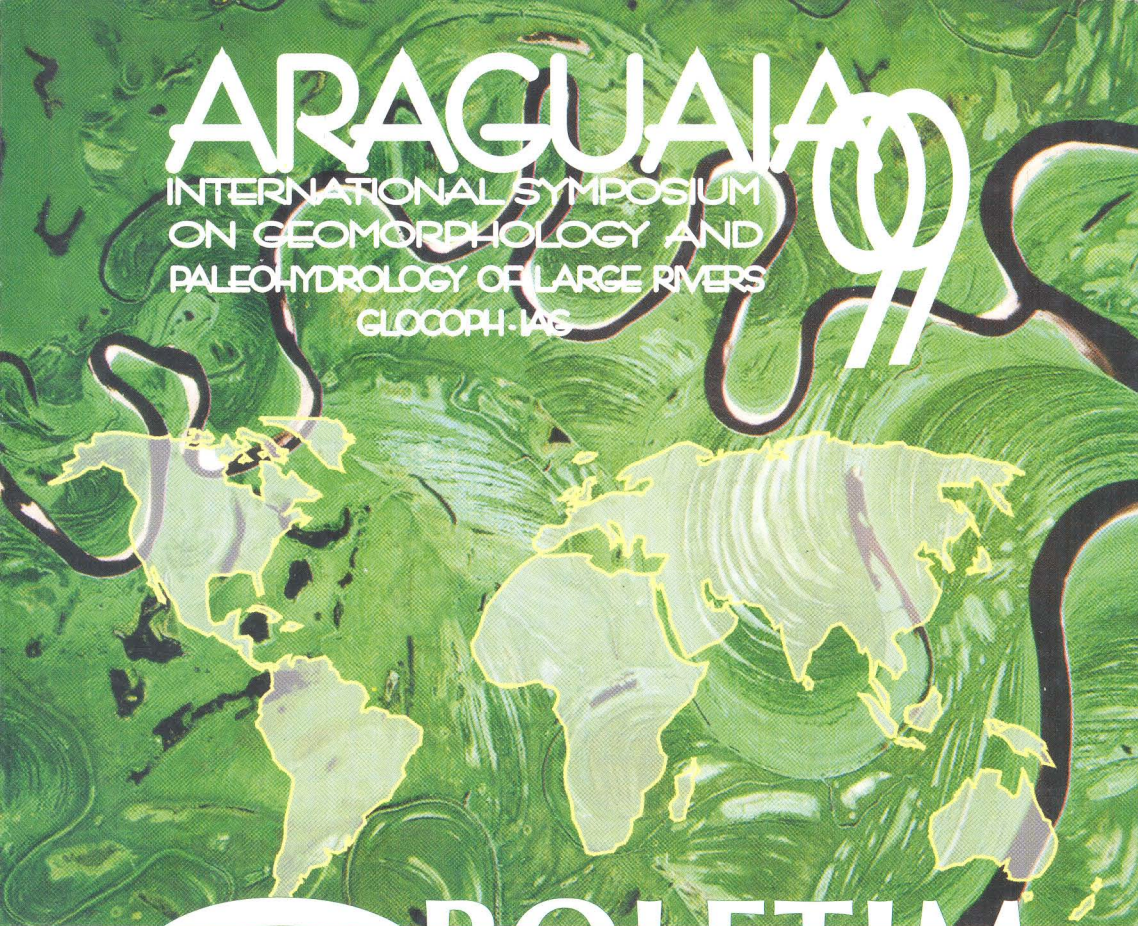


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CLIMATE CHANGES AND HUMAN IMPACT REFLECTED IN LARGE AND SMALL BASINS IN THE POLISH CARPATHIANS

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The study aims at reconstructing depositional processes, distinguishing phases of the intensification of morphogenetic processes in the Upper Vistula basin (more than 9000 km²) and its small tributaries and establishing absolute age of the sediments.

Serafa (Srawa), Podlezanka and Stara Rzeka are small Forecarpathian rivers of the length about 15 km and drainage basins less than 50 km² belonging to the Vistula tributaries east of Cracow. Rivers drained the region covered by loess and elevated to 190-360 m a.s.l. The Rada river (25 km length and 90,8 km²) is a tributary of the San. Its basin cover also the loess area in the front of Carpathians.

In sediments of the Vistula near Cracow and Forecarpathian tributaries the climatic changes of the Late Glacial are marked by the change of the type of sedimentation (Kalicki 1997). The warmer periods (Bölling, Alleröd, Eoholocene) of richer vegetation were the phases of stabilization of processes both in basins and on alluvial fans, so, organic layers come from these periods. In the periods of cooling (Older Dryas, Younger Dryas) when the vegetation was more open the accumulation of clastic sediments occurred. The Younger Dryas marked both in the big fluvial systems like the Vistula (Kalicki 1991) and in the small ones like the Serafa or the Podlezanka (Kalicki 1997). However, in the Eo- and Mezoholocene there was a lack of the crucial changes of the type of accumulation on the alluvial fan and the bottom of the Serafa, Stara

Rzeka and the Podlezanka valleys both having a dense vegetation cover. What results from this is that the Holocene phases of the intensified fluvial activity (comp. Starkel 1983) well marked in the whole section of the Vistula river valley near Cracow (Kalicki 1991, 1996) are not marked in the small Forecarpathian valleys.

OSL and TL dating of silty sediments from Stara Rzeka basin and the age of oldest buried soil from The Rada basin documented the increase morphogenetic processes conditioned by human activity during the Neolithic. Only in the Subboreal and in the Subatlantic a rapid change occurs probably connected with the human activity and the agricultural cultivation of the loess slopes. Formation of buried soils on bottom of the Rada river were probably connected with the deforestation of its basin and the soil erosion (Kalicki, Saňko 1998). In the Podlezanka basin a gradual increase of mineral substance in peats occurs which finally leads to the covering of the peatbog in the valley bottom by the humus clays. The intensive stage of accretion of the Serafa alluvial fan occurred the sediments of which considerably differ from the ones deposited in the Eo- and Mezoholocene (Kalicki 1997). The delluvial and overbank deposits 4 m thick were deposited in the Stara Rzeka valley since 2000 BP (Bluszcz, Pietrzak 1998).

The results of research are crucial from the point of view of discussion on the subject of reflection of the climatic changes and of human activity on sediments of valleys of various size. In the small Forecarpathian valleys the reflection on the Late Glacial climatic changes is found, however, the reflection on the period of the full forestation in the Eo- and Mezoholocene is missing. Only the anthropogenic deforestation in the Neoholocene caused the almost complete change of the type of sedimentation in small valleys. However, the influence of human activity was so strong that the reflection on climatic changes in these valleys in this period is missing (Kalicki in print).