



## **The relevance of landscape formation during Holocene for modern geosystems**

H.-R. Bork (1), A. Beyer (1), B. Damm (2), S. Dreibrodt (1), C. Lubos (1), B. Terhorst (3)

(1) Ecology-Centre, University of Kiel, Germany, (2) Institute of Geography, University of Regensburg, Germany, (3) Institute of Geography, University of Tuebingen, Germany and University of Vienna, Austria

(mail@hans-rudolf-bork.de / Fax: 00494318804083 / Phone: 00494318804030)

In Central Europe intensive land use began during Neolithic, Bronze or Iron Ages or in some hilly landscapes as recently as Medieval Times. At most slopes slight hillslope erosion dominated in agriculturally used hilly areas during Neolithic Age. Gully erosion was an exception. Extended and intensified agriculture enabled strong hillslope erosion and at some sites gullying during Bronze Age, Iron Age and Roman Times. In total, the surfaces of arable land were lowered by soil erosion in regions with highly erodible soils several decimetres, in others only a few centimetres during prehistoric times. After the decline of the Roman Empire woodland spread and soil development was intensive. No soil erosion and thus no sedimentation in the flood plains occurred in catchments that were totally wooded. Since the 7<sup>th</sup> century the woodland was cleared and agriculture spread first in basins with fertile soils and then during high Middle Ages in the central German mountains and in the sandy areas of north-east Germany. At a few sites clearings in early or high Medieval Times and subsequent agriculture enabled gullying. In most cleared areas slight hillslope erosion dominated. Population pressure was high at the beginning of the 14<sup>th</sup> century, when the period of high medieval warm weather with high yields turned into lower summer temperatures and a growing number of weather extremes, years with disastrous yields, famines, high groundwater levels, surface runoff, floods and dramatic soil erosion. The 1000-year precipitation, runoff, and erosion event hit western Central Europe from July

19<sup>th</sup>, 1342, until July 25<sup>th</sup>, 1342: Warm and humid air was flowing from the eastern Mediterranean into western Central Europe, causing there an extraordinary high amount of precipitation. More than 30% of the total soil erosion of the past 1500 years occurred during this event. The effects of this and some other remarkable events which are still visible and relevant for modern geosystems are presented.