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Equilibrium and non-equilibrium scenarios using paleodata as a tool to assess the future environmental changes on the east-european territory

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Two versions of the scenarios of environmental changes were worked out: the so called equilibrium and non-equilibrium ones. The equilibrium scenarios correspond to the situation when the ecosystem structures achieve their complete reorganization under the new climatic regime. For instance according the paleoreconstruction in this case the shift of zonal boundaries could reach by 500-800 km. But such records requires at least several hundred years. Another approach namely non-equilibrium scenarios take in consideration the peculiarities of the real reaction in time of the ecological, physiological, biochemical capacities of the ecosystem components on the climate changes. Both approaches were applied to the territory of the East European plain. The climatic and environmental reconstructions obtained for Holocene optimum (circa 5.5 kyr BP) and the Mikulino (Eemian) interglacial optimum (circa 125 kyr BP) were used for the equilibrium scenarios and three time intervals within 21st century (the 2030s, 2050s and 2080s) were used for non-equilibrium scenarios. In the first decades of the 21st century the most probable changes involve herbaceous plants and tree regrowth. It will only be by the end of the century that tree-species penetration of new areas and shifts of zonal boundaries may be expected. The predicted increase in potential evaporation may result in a reduction of wetland areas and slower peat formation. In the north of the plain, soil-forming processes will presumably respond to warming mainly via accelerated humification. Somewhat enhanced leaching would be typical for the subzone of podzolic soils at the end of the century, thus bringing about the initial phase of sod-podzolic soil formation. The area of chestnut soils will show a tendency to decrease as compared with the present day. Some undesirable

geomorphological processes and natural hazards are also considered.