



Dynamic interactions between abiotic and biotic ecosystem compartments – case study Huehnerwasser landscape observatory

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The Huehnerwasser catchment was constructed 2004-2005 in a post-mining landscape in Eastern Germany and was left for an unmanaged primary ecosystem succession. At the same time a comprehensive monitoring program was launched for observing the expected dynamic development of this 6 ha site. During the following years this artificially created system was subject to a series of fast changes with regard to morphology, hydrology or vegetation cover.

In summary, these processes resulted in significant alterations of the original, initial system within a short period of time. This development can be divided up into single phases with dominating processes or groups of processes. A first phase was mainly characterized by interactions between abiotic system components such as water and substrate. However, already in this very early developmental phase biotic components in the form of microorganisms were a crucial system forming factor by means of biological soil crusts. This period was quickly replaced by a second phase with dominating hydrological processes. During this phase the local groundwater body of the system developed to its full extent. With the beginning of the present phase biota gained control of the system behavior. Particularly plants and related processes such as water uptake and evapotranspiration are now responsible for new modifications of the system.

The Huehnerwasser site offers an example of young and highly dynamic ecological systems. This transitional development of a very young ecosystem contrasts with the behavior of mature ecosystems with slow and less pronounced changes unless the system is disturbed. In this paper we present insights into a unique landscape observatory which illustrates the dynamic nature of natural systems in fast motion.