

Patterns and processes of initial ecosystem development in an artificial catchment

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Since July 2007 a new Transregional Collaborative Research Center (SFB/TRR 38) funded by the Deutsche Forschungsgemeinschaft has gathered scientists from Cottbus, Munich and Zurich. As the main research site the group uses the artificial catchment 'Chicken Creek' built in the Lusatian lignite-mining area close to Cottbus, Germany. The catchment with an area of 6 ha including a small lake is mainly composed of a 2-4 m layer of sandy to loamy Quaternary overburden sediments above a 1-2 m clay layer that seals the total catchment area at the bottom. No restoration, planting or other reclamation measures were carried out to allow natural development. Main research objectives are:

-Which abiotic and biotic patterns and processes are regulating the initial phase of ecosystem development?

-How do processes interact with abiotic and biotic patterns?

-Which patterns and processes can be used to define development stages?

-Which parameters are suitable for generalization and application to other initial ecosystems?

Processes like mineral weathering, soil formation, humus accumulation, plant and microbial succession, development of flow paths and element cycling are studied in interaction with spatial patterns to integrate up to the catchment scale.

The last deglaciation of the Eastern Laurentide Ice Sheet

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The Laurentide Ice Sheet (LIS) was the Earth's dominant continental ice sheet during the Last Glacial Maximum (LGM). The deglaciation of the LIS following the LGM represents a dramatic environmental change and released enormous amounts of fresh water to the Atlantic Ocean, potentially slowing down the North Atlantic Deep Water formation and, in turn, affecting global climate. To evaluate the impact of this fresh-water signal, it is important to know the timing and rate of retreat of the LIS at the end of the LGM, particularly along the Eastern margin of the United States.

Moraines and other glacial features in New England and New York provide evidence of the advance and retreat of the Eastern LIS. Here, we present an extensive, precise and internally consistent ¹⁰Be chronology for the onset of the termination of the LGM of the Eastern LIS. The chronology indicates that the termination occurred significantly earlier than the main warming during the termination period recorded in Greenland ice cores, the Boelling/Alleroed event about 14.9 ky ago and, in turn, that the LIS termination might rather follow a southern temperature signal best recorded on the other site of the planet in Antarctic ice cores.