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An ecosystem approach to evaluate restoration measures in the lignite mining district of Lusatia/Germany

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Lignite mining in Lusatia has a history of over 100 years. Open-cast mining directly affected an area of 1000 km2. Since 20 years we established an ecosystem oriented approach to evaluate the development and site characteristics of post-mining areas mainly restored for agricultural and silvicultural land use.
Water and element budgets of afforested sites were studied under different geochemical settings in a chronosequence approach (Schaaf 2001), as well as the effect of soil amendments like sewage sludge or compost in restoration (Schaaf & Hüttl 2006).
Since 10 years we also study the development of natural site regeneration in the constructed catchment Chicken Creek at the watershed scale (Schaaf et al. 2011, 2013).
One of the striking characteristics of post-mining sites is a very large small-scale soil heterogeneity that has to be taken into account with respect to soil forming processes and element cycling.
Results from these studies in combination with smaller-scale process studies enable to evaluate the long-term effect of restoration measures and adapted land use options. In addition, it is crucial to compare these results with data from undisturbed, i.e. non-mined sites.

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