



Advancing post-mining rehabilitation - geomorphic design and landscape evolution models

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Open-cut mining disturbs the earth's surface to extract a resource. Post-mining landscapes with large volumes of materials require shaping for optimal erosional stability and ecological and visual integration into the surrounding undisturbed landscape. Computer modelling and design tools can assist in this. Here we demonstrate the complementary capabilities of landscape evolution modelling (SIBERIA) and geomorphic design software (Natural Regrade with GeoFluv). An existing site is used as a case study where a landscape has been constructed based on geomorphic principles. The SIBERIA modelling demonstrated that geomorphic design reduced erosion by half that of conventional designs while being able to store increased mine waste volume. Further, the spatial pattern of gullying was able to be predicted by modelling, which allowed management in subsequent geomorphic design, and successively more stable patterns. This work demonstrates that the joint use of geomorphic design software with landscape evolution modelling have complementary capabilities and can greatly enhance mine rehabilitation.