RCHILD – an R-package for flexible use of the landscape evolution model CHILD

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Landscape evolution models provide powerful approaches to numerically assess earth surface processes, to quantify rates of landscape change, infer sediment transfer rates, estimate sediment budgets, investigate the consequences of changes in external drivers on a geomorphic system, to provide spatio-temporal interpolations between known landscape states or to test conceptual hypotheses. CHILD (Channel-Hillslope Integrated Landscape Development Model) is one of the most-used models of landscape change in the context of at least tectonic and geomorphologic process interactions.

Running CHILD from command line and working with the model output can be a rather awkward task (static model control via text input file, only numeric output in text files). The package RCHILD is a collection of functions for the free statistical software R that help using CHILD in a flexible, dynamic and user-friendly way. The comprised functions allow creating maps, real-time scenes, animations and further thematic plots from model output. The model input files can be modified dynamically and, hence, (feedback-related) changes in external factors can be implemented iteratively. Output files can be written to common formats that can be readily imported to standard GIS software.

This contribution presents the basic functionality of the model CHILD as visualised and modified by the package. A rough overview of the available functions is given. Application examples help to illustrate the great potential of numeric modelling of geomorphologic processes.