



Sinks in the DEM - useful for hydrologic modeling?

J. Kiesel, **G. Hoermann**, N. Fohrer

Christian-Albrechts-University Kiel, Ecology-Center, Department of Hydrology, Germany
(jkiesel@hydrology.uni-kiel.de / Phone: +49-431-880-1237)

Using DEM as an input for hydrologic modeling has enabled an almost realistic integration of the physiography. However, problems arise if depressions can be found in the landscape. These areas that do not drain out anywhere are represented in the DEM as sinks. When calculating hydrologic parameters, these sinks can cause an endless processing loop and therefore the DEM has to be manipulated in order to fill the sinks in the first place. Naturally occurring processes like surface water ponding and infiltration in depressions are thus not depicted in the model. Especially in landscapes where low average surface slopes with gently rolling hills are present, it is considered that this is an oversimplification (DU et al. 2005).

Counteracting this problem, the ecohydrological model SWAT (ARNOLD et al. 1998, NEITSCH et al. 2005) enables the application of pothole functions that mimic ponding and infiltration processes. However, an applicable methodology has to be found to transfer the depressions in the landscape so that they can be processed as potholes in the model. Therefore, the area and depth of the sinks was calculated by subtracting the original from the filled DEM. Using PCRaster and ArcGIS functions, the found sinks were introduced into the model.

The scope of the provided poster is testing this methodology for the 50sqkm Kielstau catchment in northern Germany. The detailed methodology and the results that show a decrease in surface runoff are presented on the poster.