

LISEM

Model Uses	LISEM is a soil erosion model used to simulate the hydrology and sediment transport during and after rainfall events. The model is most ideally used as a research tool.	
Major Categories	Water Quality; Geomorphology; Decision Support	<u>Subject Knowledge Level</u> Intermediate
Minor Categories	Erosion; Sediment Sources; Transport; Time Series	<u>Technical Difficulty Level</u> Advanced
Model Type	Physical Model	<u>Geographic in Nature?</u> Yes

Abstract

LISEM, the Limburg Soil Erosion Model, simulates the hydrology and sediment transport during and immediately after a single rainfall event in a small catchment. The model has been used so far in catchments between 10 and approximately 300 ha. LISEM was built to simulate both the effects of the current land use and the effects of soil conservation measures.

The model was originally made for the Province of Limburg, the Netherlands, to test the effects of grass strips and other small scale soil conservation measures on the soil loss. In the "Limburg" project, three catchments were fully equipped and monitored for 5 years by the local government (Waterboard Roer en Overmaas), the Free University of Amsterdam (Physical Geography), Alterra and the Utrecht University (Physical Geography). Although it can be used for planning purposes it is essentially a research tool because of its complexity.

The philosophy behind LISEM is that the model assumes nothing! An example: if a land use change is modeled there is no way of telling LISEM that it should change all the related variables because the crop is winter wheat and not sugar beet. The user must change all appropriate variables him/herself: infiltration variables, surface roughness, Manning's n etc. This gives the user more freedom and it is much clearer what happens in the simulation, however this also means that the user knows what he/she is doing.

Future Developments

Unknown

Model Limitations

Unknown

Model Features

LISEM takes into account and models information for:

- Rainfall
- Interception
- Surface storage in micro-depressions
- Infiltration
- Vertical movement of water in the soil
- Overland flow
- Channel flow (in man-made ditches)
- Detachment by rainfall and through fall
- Transport capacity
- Detachment by overland flow.
- Influence of compaction (e.g. by tractor wheelings)
- Small paved roads (smaller than the pixel size)
- Surface sealing on the hydrological and soil erosion processes

Required Data Types

- GIS Raster including Catchment maps
- Vegetation maps
- Soil surface maps
- Infiltration related maps
- Erosion/deposition related maps

Model Outputs

GIS Raster including:

- Totals
- Hydrograph
- Erosion Maps
- Time Series data

Hardware Requirements

None noted

Supported Platforms			
DOS	<input type="checkbox"/>	UNIX	<input checked="" type="checkbox"/>

Software Requirements

None noted

Windows	<input checked="" type="checkbox"/>	Macintosh	<input type="checkbox"/>
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Cost, Licensing and Availability

Free - available from link below.

Source

University of Utrecht

Source URL

<http://www.geog.uu.nl/lisem/>