

Erosion risk for climatic and land use scenarios in Europe

S. Mantel, G. van Lynden, J. Huting
 ISRIC - World Soil Information
 POBox 353 6700 AJ Wageningen, The Netherlands
 Stephan.Mantel@wur.nl

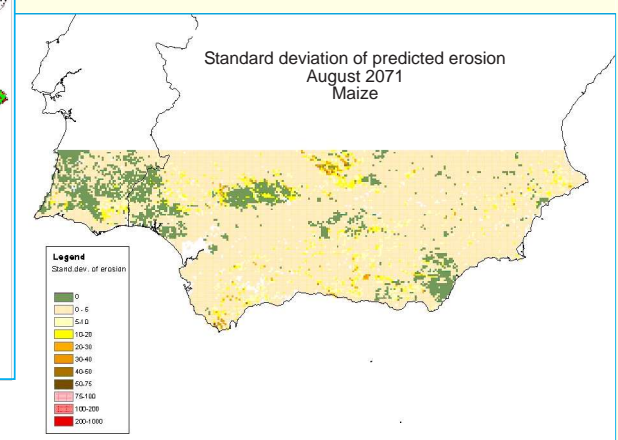
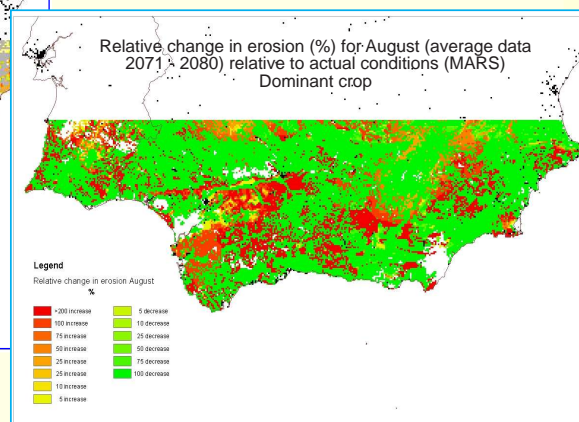
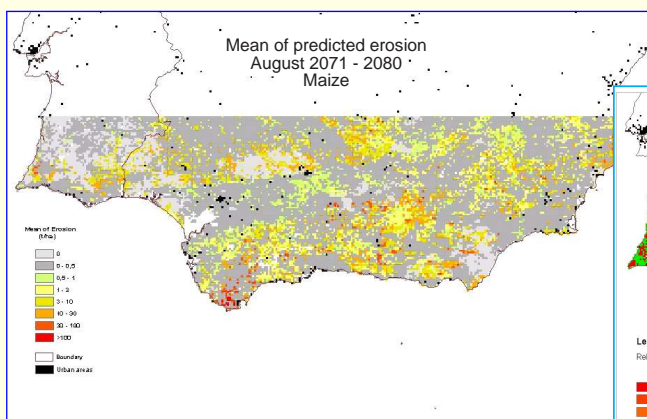
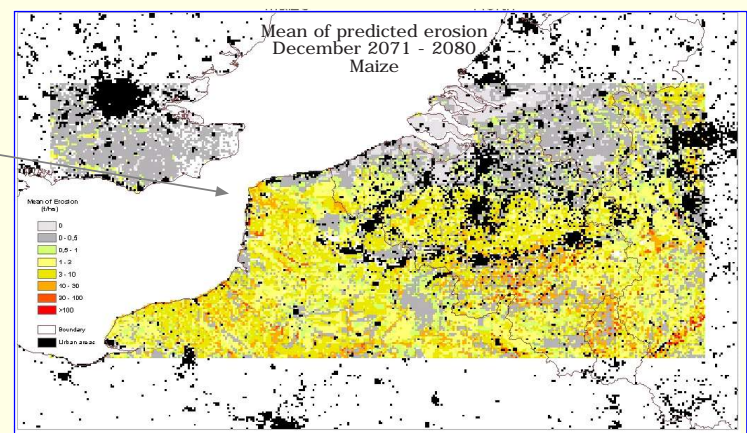
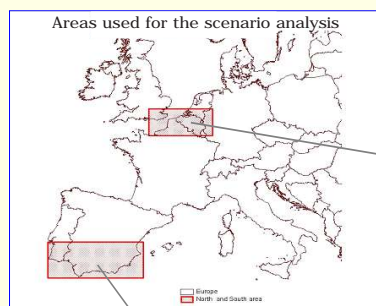
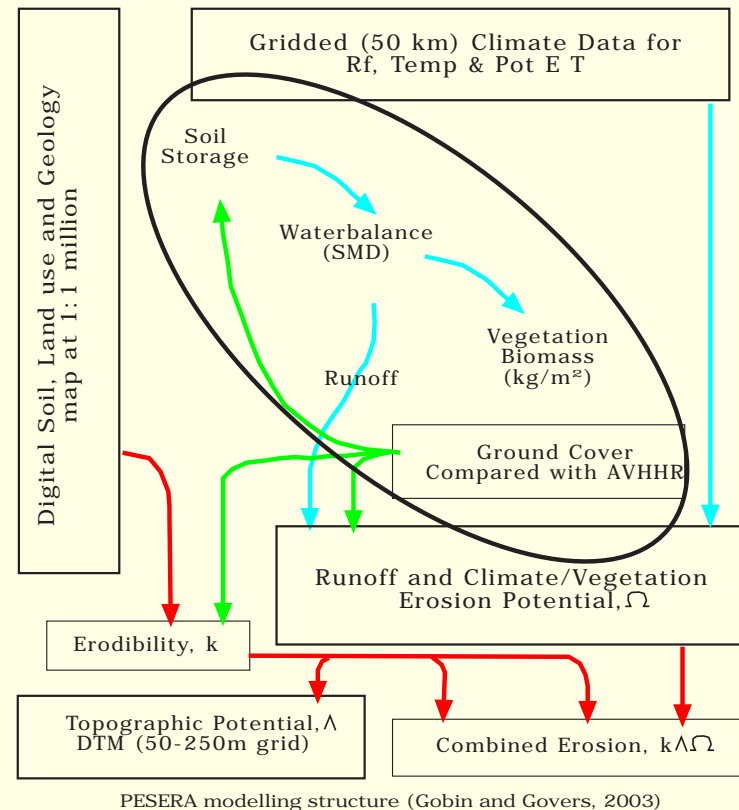
Pan European Erosion Risk Assessment (PESERA)

Land degradation is widespread in Europe. Yet its severity, and the areas affected, are poorly quantified. PESERA simulates the effects of climate change on soil erosion risk in contrasting areas of Europe.

The PESERA concept differs fundamentally from empirical models such as the USLE and its derivations; it is runoff-based and estimates potential monthly erosion at a 1-kilometre resolution.

Erosion and climate change

The PESERA model was run for a 2071-2080 for climatic scenario in a northern and a southern window. Two land uses were considered: current and all-arable-under-maize. A Hadley Centre climate change scenario (SRES-A2b) was used with the original 50 km resolution of the monthly climatic parameter grids interpolated to a 1 km grid. Soil erodability was assessed from the European Soil Database (v. 1.0), scale 1:1 million.



Results

The model indicates enhanced erosion risk for the northern window, following the forecasted change in rainfall: an increase in autumn and winter rains and a decrease in summer. However, not all spatial variations in the northern window can be explained by differences in rainfall, and only to some extent by topography and/or land use.

For the southern window, a decrease in erosion risk is predicted for the 2071-2080 scenario; simulations were similar for current land use and all-arable-under-maize.

References
 Gobin A and Govers 2003. Pan-European Soil Erosion Risk Assessment. Third Annual Report. EU Fifth Framework Programme. Project QLK5-CT-1999-01323. Available at: <http://pesera.jrc.it>.

Kirkby MJ, Le Bissonais Y, Coulthard TJ, Daroussin J and McMahon ML 2000. The development of land quality indicators for soil degradation by water erosion. *Agriculture, Ecosystems and Environment* 81: 125-136

Mantel S, Van Lynden GWJ and Huting J 2003. Pan European Erosion Assessment (PESERA). Work package 6: Scenario analysis. Final report: April 2003 - September 2003, ISRIC - World Soil Information, Wageningen

The climate and land use scenario analysis for selected areas in Europe was performed for the Pan-European Erosion Risk Assessment (PESERA), an EU Fifth Framework Programme (Project no. QLK5-CT-1999-01323)