



Sensitivity analysis of distributed erosion models - Framework

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We introduce the (P,R,p) procedure for analysis of distributed erosion models, evaluating separate sensitivities to input fluxes (precipitations P), to the propensity of soil to surface flow (runoff conditions R) and to specific erosion properties (descriptive parameters p). For genericity and easier comparisons between models, super-parameters of "equivalent slope" and "equivalent erodibility" are assembled from innate descriptive parameters: parameterization is reduced to four coded integers that are arguments of the soil loss function. Directional sensitivities are calculated in a deterministic way, associated with any selected displacement in parameter space. In this multi-stage and risk-orientated procedure, special emphasis is placed on trajectories from best-case towards worst-case scenarios, involving one-at-a-time variations and Latin Hypercube samples. Sensitivity maps are produced in the super-parameter plane, tracing risk isovalues, estimating the relative importance of the equivalent parameters and of their spatial distributions.

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