

## ***Interactive comment on “Exploring model sensitivity issues across different scales in landslide susceptibility” by F. Catani et al.***

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IN GENERAL: The paper is clear, concise and innovative. The subject and the presented case study are quite interesting. The presentation is quite good and the discussion is excellent.

SUGGESTIONS: o Lines 28: «the land surface geometry (derived from of DTM)» it is more appropriate to change it to either «geomorphometry» or «geomorphology» since raster data sources are used to derive landcover maps too, etc. etc. o Lines: 20-30 « In addition, for each factor we also included in the parameter set the standard deviation (for numerical variables) or the 0 variety (for categorical ones)» Rather replace it as follows: «These factors within the model correspond to a range of critical values for

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both numeric (standard deviation) and categoric data (variety) » o Line 31: «single» replace it with «subset of input parameters» o Line 33: « then, with progressively smaller subsamples of the parameter space» replace « then an iterative process was implemented and progressively smaller in dimension subsets were considered, resulting to data dimension reduction process that allowed the optimal dataset definition) o Line 34: please erase: « Considering the best set of parameters we also studies» o Linse34-35: « the impact of scale and accuracy of input variables and the of RF model random component on the susceptibility results» Rewrite: The scale and data accuracy effect the RF model derived susceptibility results was also modelled» o Lines 36-37: « We apply the model statistics to a test area in Italy, the basin of the Arno river (ca. 9000 37 km2), we present the obtained results and discuss them» rewrite please: « The modes was tested in the Arno river basin (Central Italy)» There is no need for details (Area extent) in the abstract o Lines 38-39: « Results confirm that the choice of parameter set, mapping unit resolution and training sampling method highly influences the overall accuracy of classification and prediction results» Rewrite: « the method was successful since data dimension, mapping unit (Scale), and training process proved to highly influencing the classification accuracy and the prediction process» o Line 47: «documents» ERASE o Line 48: « They represent, usually as digital maps, the distributed» REWRITE « They depict the» o Line 51: « manners» REWRITE « methods» o THE AIM IS QUITE CLEAR & INNOVATING o THE STATE OF THE ART (review of the previous research efforts) is quite good. o The term definitions and the problem definition is quite good. o I suggest to erase the lines 113-116 since there is no need to refer to the study area and the results in the introduction section «(We apply the model statistics to a test area in central Italy, the hydrographic basin of the Arno river (ca. 9000 km2), we present the obtained results and discuss them. We also use the outcomes of the parameter sensitivity analysis to investigate the different role of environmental factors in the test area.)» o Section 2 (Material & Methods) might be renamed to METHODOLOGY o The presentation of the method and it's relative advantages are quite good. o 298-300: «All of them can be put in relation with some physical process or can be

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used as indicators of the presence/absence of landslides» Rewrite: « Morphometric parameters are related to geomorphologic processes and consequently to landslide susceptibility» o Lines 300-302. : «We resampled it at the other resolutions used in this work (20, 50, 100, 250 and 500 meters) and, separately for each of them, a series of topographic attributes were extracted with the same pixel size using ArcGIS 9.3» REWRITE : «The data layers were resampled to 20, 50. .... 500 m resolution by nearest neighbor method ? » . THERE IS NO NEED TO REFER TO SOFTWARE (it ia quite trivial well known method implemented in every GIS soft). o Line 305: <PIXEL> should be replaced by «KERNEL» o LINE 306: « The elevation basically corresponds to the DEM. This parameter» ERASE and replace by «ELEVATION is used in landside. .... » o LINE 310: add a bullet to ELEVATION ST.DEV since it is a different parameter o LINES 320 and 322: replace the phrase <KINDS OF CURVATURE> with CURVATURE COMPONENTS» (profile, planar, total curvature etc.)

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