

Interactive comment on “Landslide susceptibility mapping of Cekmece area (Istanbul, Turkey) by conditional probability” by T. Y. Duman et al.

Anonymous Referee #3

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This study seems to have merit, but unfortunately, the material is not presented clearly enough for me to make a reliable assessment of that merit.

The authors provide (a) reasonable motivation to study and assess landslide risk near Istanbul; (b) ample description of the study site and its geology; (c) unconditioned distributions of landslides based on a priori conditioning variables; (d) conditional probabilities for the different classes of each conditioning variable; and (e) a landslide susceptibility map that is based on a summation of unconditioned probabilities of landsliding according to the different conditioning variables pertaining at each pixel. Finally, a "Results and Conclusions" section summarizes the study's findings.

Basic grammatical errors are a problem throughout the manuscript. Editing the English in this paper would require more time than I have to devote as a reviewer—my apologies. The quality of the writing makes it difficult to assess the study's merit in places. For

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example, p. 160, line 26: "The study area has a dendritic drainage pattern, because of presence of soft lithologies and low slope angles." The second phrase of this sentence is, to me, a non-sequitor, but the sentence also contains an unnecessary comma and could use a "the" before "presence".

The Introduction goes beyond the necessary motivation and context of the problem. For example, much of the long description of Istanbul seems wholly unnecessary (e.g., "At the same time, it is a city world-famous for its natural beauty and historical monuments, reflecting its role as the capital of three separate empires. It enjoys the unique amenities of shorelines on the Black Sea, the Marmara Sea and the Bosphorus Strait.").

Section 2, "General properties of the study area", seems overly long on details. Perhaps all or most of this description is necessary, but that necessity is not apparent. Perhaps a shorter section on the study area would be appropriate here, and some of the details could be left to later discussions of factors influencing landsliding.

A long section (3) on "Landslide characteristics" follows and presents much in the way of results (i.e., before any "Methods" section). I cannot tell for certain, but this section seems to set up a "straw man" of non-revealing results. I kept thinking that this analysis was awfully simplistic—of course most of the landslides will not occur in slope classes comprising small fractions of the study area, but normalizing by that small area might be revealing. I think this section should be omitted, although parts of it, perhaps in different (e.g., normalized) form might be usefully presented in the "real" analytical part of the manuscript.

On the 11th page of the manuscript, the authors present their "Methodology", i.e., the one that carries out the analysis with "conditional probability" as indicated in the title. I would recommend moving this section to directly follow the introduction. As is, it seems way too long to wait for the real point of the paper. This section also includes results, and these should be split off into a separate section. I do not find

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that the methods are adequately explained. On my first read-through, I thought that the landslide susceptibilities were obtained from the conditional probabilities, but this appears not to be the case. Rather, these susceptibilities are calculated as the sums of unconditioned probabilities of landsliding at each pixel based on its respective classes in the several conditioning variables. This calculation is glossed over and, considering the first three words of the title are "landslide susceptibility mapping", deserves more thorough treatment. Also, as these susceptibilities are apparently sums of $p(A)$'s, i.e., unconditioned probabilities (i.e., not $p(A|B_i)$'s), and the title says that the mapping is "by conditional probability", I am confused on this point. And I have no idea how equation (8) was derived or how it is relevant (for example, what is the significance of negative vs. positive values?). I also do not understand the analysis represented by figure 27, which seems to be a measure of performance of the mapping but the origin of which is not explained.

Section 5 is titled, "Results and conclusions", and follows after no discussion of the results presented in the "Methodology" section. This section is unsatisfactory. Not only does it contain no new information, but it is wholly composed of text sampled, with grammatical errors intact, from other parts of the manuscript.

I would like to provide more detailed comments, but I am not sure they would be useful because this paper needs major reorganization and rewriting. Also, time is of the essence. I do believe that the authors are essentially conducting their analysis correctly, but the value of this paper is obscured by the manuscript's shortcomings.

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