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Hydrology and Earth System Sciences Discussions

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

T. Y. Duman et al.

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Reply of the authors for the comments of Anonymous Referee #3 on "Landslide susceptibility mapping of Cekmece area (Istanbul, Turkey) by conditional probability" by T. Y. Duman et al.

We would like to express our sincere thanks to the Anonymous referee #3 for his/her critical review on our manuscript, because we believe that these comments improve the quality of the paper. Based on the comments, the following corrections and revisions were made and the final form of the manuscript was sent to the Editor.

Reviewer Comment - 1: 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 example, p. 160, line 26: "The study area has a dendritic drainage pattern, because of presence of soft lithologies and low slope an-

gles." 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".

Reply of the Authors - 1: Whole manuscript was edited again carefully and the grammatical and syntax errors detected were penned.

Reviewer Comment - 2: 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.").

Reply of the Authors - 2: The introduction chapter of the manuscript was re-organized and shortens as requested by the Referee.

Reviewer Comment - 3: 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.

Reply of the Authors - 3: The section 2 was re-organized under two separate headings such as “Geological setting of the study area” and “Morphologic and hydrologic characteristics of the study area”. Also, these sections were refined by removing unnecessary parts of the chapters.

Reviewer Comment - 4: 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

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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.

Reply of the Authors - 4: We are agreeing with the Referee about the high content of this chapter. However, as the focus of this study is landsliding, we think that the content of this chapter should be kept. In addition, the information included by the chapter of landslide characteristics may be useful for the readers.

Reviewer Comment - 5: 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 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|Bi)'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.

Reply of the Authors - 5: The methodology section was re - organized and grouped under two separate headings such as "theoretical background" and "application of conditional probability. Also, the chapter of theoretical background was moved to after the

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introduction chapter. In addition, we provided additional explanations about application of methodology and discussion of results. In fact, this equation (Eq. 8) is a form of calculation of weight values of conditioning parameters in landslide density approach. Besides, new explanations about Fig. 27 were given in the revised manuscript.

Reviewer Comment - 6: 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.

Reply of the Authors - 6: Considering the Referee comments, the results and conclusion section was re-organized and re-written.

Interactive comment on Hydrology and Earth System Sciences Discussions, 2, 155, 2005.