

RESPONSE TO TOPICAL EDITOR COMMENTS

Manuscript: SOIL Discuss., 2, 647-674, 2015

Title: Development of a statistical tool for the estimation of riverbank erosion probability

Dear Editor,

We would like to thank you for the time that you have spent on reading and commenting on the above manuscript. You have provided useful and constructive comments that helped to improve the manuscript overall.

The response to the comments are given in the revised manuscript (using track changes) and below in italic font.

We hope the changes listed have made the manuscript suitable for publication and we look forward to your response.

Sincerely,

Dr. Emmanouil Varouchakis

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Topical Editor Comments

The authors have made an effort to improve the manuscript and to responding the reviewers' comments. There are, however, some issues that remain unresolved which I consider relevant.

- 1) Although the variables identified by both models are in this case the bank slope and cross section, the authors should reflect somehow over the role of soil and its composition (texture, structure ...) in these results, at least as possible line for future research

Response

Thank you for the suggestion. The authors have respond to the comment using the following text.

In the manuscript has been placed in the introduction and the discussion sections to retain the text flow.

“The bank erosion process is closely related to soil composition of the riverbanks, and the erodibility factor is affected by the composition of sand, silt and clay. A high content of sand and silt leads to easily eroded soils since they are fine in size and can be carried away by river flow. The most common type of bank structure is a stratified or interbedded bank of cohesive or non-cohesive layers. Riverbanks made up of non-cohesive soil are very erodible due to the low clay-content and the weak erosion-resistant strength of the bank soil. Instead cohesive soils have increased clay or clayey silt content and are more resistant to erosion. Non-cohesive soils erode as individual grains, while cohesive soils erode as aggregates. On the other hand a bedrock bank is usually very stable and will only experience gradual erosion (Raudkivi 1998, Roslan et al., 2013). (Page 2-3 lines 28-32, 1-5)

The LR based models results suggest that riverbank erosion probability generally increases as the bank slope increases and the river cross section decreases. This is due to an increase of the flow velocity that removes the non-cohesive soil components from the banks. Based on field measurements analysis, the bank material at the Koiliaris River was classified as “fine rounded sand”. The fine rounded material is easier removed due to its low resistance and increased flow friction. This characteristic is associated with the

LR based models results, as they provide mainly favorable probabilities of riverbank erosion at the validation points. However, to connect the soil properties effect with the probability of erosion that results from geomorphological variables in detail, the LR based models should account also for soil properties, such as particle size distribution and the bulk density that consider also mechanical properties of the riverbanks. This is a task that the authors plan to address at a near future research. (Page 13-14 lines 24-32, 1-2)”

- 2) The paper is fairly readable and not poorly written, but needs a careful editing for minor grammatical & syntax errors, missing commas, and format mistakes. Further, there are excess words in many cases, so a general tightening up of the writing would be helpful. For example, the paragraph (lines 20 to 25, page 4) added at this new version is redundant and could be integrated within lines 13-16 and 32-33 page 3.

Response

Thank you for the comment, our intention is to improve the paper by addressing any disadvantages.

The authors have followed the topical editor suggestion to make the text more solid, and have integrated parts in sections: Introduction, case study, methodology and discussion in order redundancy and repeatability to be avoided and to improve the text flow. Please see track changes in the submitted manuscript.

Specifically for the proposed example the new integrated paragraph can be found in page 3, lines 17-26.

In addition the text was carefully reviewed and edited for syntax, grammatical errors and punctuations (please see track changed document). Format inaccuracies regarding the page size, spacing, references and the equations (rewritten in mathtype) was addressed according to the sample doc for authors in the manuscript preparation section.