

Interactive comment on “A comparison of the soil loss evaluation index and the RUSLE Model: a case study in the Loess Plateau of China” by W. W. Zhao et al.

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The authors proposed an novel soil erosion index that aims at evaluating the effects of land cover and landuse on soil erosion and sediment loading to stream networks. Indeed, the location of certain landuse on the landscape is an important consideration in watershed scale landuse optimization. This method has some advantages over the traditional RUSLE model's C factor since RUSLE model does not address the spatial location of C distribution. Recent advances in erosion modeling has made it possible to combine RUSLE and sediment transport so location of landuse can be considered in

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estimating total sediment load at the watershed scale (see InVEST Ecosystem Service model).

I agree with the authors' response to the three reviewers who gave excellent and detailed comments on the first draft on that the the next revision should focus on comparing the difference between C factor in RUSLE and SL index rather than comparing soil loss predictions. The two models address different entities. The major contribution of the researchers is proposing a tool to identifying key regions that landuse's impacts on soil erosion are large and relatively important when other factors are equal. As showed in the current modeling results by the RUSLE, sensitive areas related to landcover may not be necessarily overlapping with high soil erosion areas, again due to climate and soil properties.

Comparing USLE C factor and SL index will clear show the importance of position of each landuse cell in addition to land use properties in contributing to soil erosion potentials. Both charts and maps can be used to contrast the differences of SL and C.

Essentially, the proposed index is a weighted average of C factor by considering each landuse cell's location and topography.

For presentation, there is room to improve. In many cases, the method description (how GIS operated) should not be in the results. I found too much review on soil erosion modeling and it is relevant. I hope the authors focus on the limitation of C factor in guiding soil conservation and how your new index is better. Comparing spatial maps of C and SLsw should be able to serve this point.

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