Biogeosciences
Discussions

Interactive comment on "Soil carbon stocks and their variability across the woodlands of peninsular Spain" *by* E. Doblas-Miranda et al.

Anonymous Referee #2

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Doblas-Miranda and co-authors report new estimates of carbon stocks in soils of the Iberian Peninsula and investigate the drivers controlling soil organic carbon dynamics. Using a total of 942 soil profiles along with climatic and land cover information derived from a literature search, the authors model soil organic C content for this region. They conclude that changes in temperature and precipitation forecasted for this area may reduce the sink C capacity of these soils. In addition, the authors show a strong correlation between changes in land cover and variations in SOC. These results shed light on possible management practices that could alleviate the consequences of climate change in this region. Because of the vulnerability of Mediterranean ecosystems to future changes in climate, the topic is of importance and within the scope of Biogeosciences.

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The authors do a good job of addressing and answering the critique of the previous submission. Specifically, those issues related with the lack of details with which the method section was previously written.

I only have a criticism which is related with the writing. I believe the paragraph structure in the Discussion section is too long in some instances. This will difficult the reading as often these paragraphs don't have a clear main topic. For instance, under the section 4.2. the authors discuss three main ideas in the same paragraph. First, which are the variables affecting SOC as suggested by their modeling effort. Second, the influence of climate and biotic factors (e.g. fire) on C stocks. Third, the authors stress the idea that mountain regions accumulate more SOC as elevation may favor conditions that slow decomposition. I think that this paragraph could be re-organized in two paragraphs, one discussing the main factors affecting this variable (i.e. climate and vegetation cover); and the second focusing on how changes in climate (temperature and precipitation) can affect soil microbial activity and ecosystem productivity. I believe that the third idea related with how elevation may decrease decomposition distracts from the main objectives of this study-at least in the way it is currently presented.

Another instance in which a paragraph does not have a main point is exemplified in the paragraph 'Although climate is . . .' (page 10925-line 21). The authors nicely start the discussion paragraph with the importance of vegetation type on determining changes in SOC. However, later the authors bounce from discussing the difficulty of predicting future land use changes in this region back to how SOC differs between each cover type.

Minor comments- - There are few instances in the Material and Methods section in which the authors use present instead of past tense. For instance (page 10918-line 9), where it says 'This last horizon (n+1) is included in the calculation only if its upper limit is < 100 cm deep' it should say 'This last horizon (n+1) was included in the calculation only if its upper limit was < 100 cm deep'. Please correct throughout the ms. - Page 10918 – Line 16 – Provide a reference as to how bulk density was estimated from total

OC (Rodríguez-Murillo, 2001?)

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