Biogeosciences

Discussions

Interactive comment on "Global NO and HONO emissions of biological soil crusts estimated by a process-based non-vascular vegetation model" *by* Philipp Porada et al.

Anonymous Referee #1

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General comments: This study provided an estimate of global NO and HONO emissions from biocrusts by improving a non-vascular vegetation model (LiBry). Specifically, the authors improved the model to predict relative cover of different biocrust types and then estimated NO and HONO emissions through extrapolating the relationship between NO and HONO emissions and water content (i.e. Figure 1). While the authors did some interesting works, I think there have a couple of major deficiencies in this study. First, the authors did not justify the worldwide applicability of the relationship between NO and HONO emissions and water content while this relationship is critical for the products (global NO and HONO emissions) presented in this manuscript. Second, the authors did very limited model validation for the NO and HONO emissions. These

deficiencies make me feel the major products, global NO and HONO emissions, are not very solid in the current version of the manuscript. Therefore, I think substantial works/improvements are necessary for addressing the deficiencies I mentioned.

Other specific points: Page 2 Line 19: Grammar error.

Page 2 Lines 33 to 34: Grammar error in this sentence.

Page 4 Line 29: Add a full stop.

Page 5 Line 15: How reliable of this relationship/method? How about applicability and uncertainties of this relationship/method?

Page 9 Line 26: Past tense should be used for what you did. Please make necessary changes throughout the MS.

Page 11 Lines 26 to 27: This sentence is not clear.

Page 15 Line 1: The sub-titles of the result section are confusing. You described a lot of results before '3.1 Global validation'; so what is the sub-title for the results described before 3.1?

Page 15 Line 15: 'report' should be 'reported'. This issue has been found throughout the manuscript.

Page 18 Line 14: Is the low sensitivity due to the simple model for NO and HONO emissions?

Page 20 Line 30 to 33: It might be worthy to provide some explanations for this statement. Why this method is more appropriate than calibration?

Page 21 Line 19: 'that' should be 'than'.

Page 22 Line 30 to 33: Does NO and HONO emissions affected by other factors in bicrust systems, such as N content etc?

C3