

Interactive comment on “Photosynthetic production of boreal ground vegetation after a forest clear-cut” by L. Kulmala et al.

Anonymous Referee #1

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Kulmala et al report the photosynthesis and respiration of ground vegetation following a clear cut. The authors base their work on field observations of different species and soil fertility. Although the underlying methodology seems sound and the paper is of interest to the readers of Biogeosciences, the manuscript lacks a clear focus. The discussion is thin and contains many loose ends that need to be tied before the manuscript becomes acceptable for publication.

- The observations (i.e. the timing of Pmax) are simply reported but no effort is made to link these observations to plant strategies (i.e. spring blooming before bud break). It would be refreshing to put your new observations in the existing framework of plant ecology and check for consistencies/surprises.

- It is intriguing that P expressed as units per ground area is more stable than expressed

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as units per leaf mass. The discussion on this issue is inadequate i.e. the potential causes are not back-upped by numerical estimates neither literature references. The authors have the data to do better.

- The photosynthesis of the ground vegetation is large. At Hyytiälä GPP varies between 850-1100 g C m⁻² y⁻¹. In the clear cuts under study, 760 g C m⁻² y⁻¹ is assigned to the ground vegetation, thus, leaving only 100-350 g C m⁻² y⁻¹ of GPP for the pine and birches on site. Your finding also implies that GPP is almost constant during succession (confront with classic succession theory i.e. Odum 1969). Last, GPP – Re equals NEP and this should be of the same magnitude as the standing biomass for perennial plants. Is this the case for your sites?

- The manuscript needs to go through careful editing. Besides numerous grammar errors and typos, the manuscript will benefit from some restructuring. For example the first paragraph of the introduction is irrelevant for this study, also line 16-26 on page 4605 are not necessary to introduce your work. A separate results and discussion section typically help the authors to better structure their work and helps the reader to get the key results. Also §3.3.2 contains no text and sometimes the line of thought needs to be better explained i.e. page 4615 line 4 – and further you state that b is set constant and then engage in a discussion of the seasonal changes in b. This kind of problems could be easily resolved by careful editing. One figures has Finnish text labels.

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