

Biogeosciences Discuss., referee comment RC2  
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## **Comment on bg-2022-162**

Anonymous Referee #2

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Referee comment on "Faded landscape: unravelling peat initiation and lateral expansion at one of northwest Europe's largest bog remnants" by Cindy Quik et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-162-RC2>, 2022

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The paper by Quik et al. explores the initiation and lateral expansion of one peatland (Fochteloërveen) in the Netherlands. This peatland has been heavily utilized by the humans over millennia, so the standard approach based on radiocarbon dating of basal peat is not as straightforward as in most of the similar peatland expansion studies. To solve the problem, the authors use an approach, where the relationship between age of the basal peat is compared with three variables, which are the total thickness of organic deposits, elevation of the Pleistocene mineral surface that underlies the organic deposits, and groundwater-fed wetness based on elevation of the mineral surface and current hydraulic head. Using these relationships peat initiation maps are generated for the peatland, showing how it has grown laterally during the Holocene.

The paper is generally solid and provide new results about the history of the peatland, showing that the oldest peat is much older than earlier investigations have indicated. However, the paper can be improved and streamlined to make it more informative and easy to read.

My main comments are:

General structure - much of the text is general background about the peatlands, which is already familiar to the potential readers of the paper such as this. For example, the introduction is too long because such basic facts like the idea for the formation of peat and the processes for peatland initiation are described. These can be deleted or at least shortened. Similarly, streamlining is needed to avoid unnecessary repetition. For example, on pages 5-6 the results of earlier studies are explained and this is repeated in Discussion on lines 473-485. All in all, the short review on pages 5-6 "Peatland development and decline in the (wider) study area" seems out of place and could be deleted.

Study area - it is surprising that the peatland is not described at all, apart from stating its size on page 6. It would be important to describe the study site so that the readers would have at least a rough idea about its current topography, vegetation, hydrology and different types and intensity of human impact.

Results - dating is a critical part in a study such as this, so the dating results must be presented better and more in detail. It is necessary to show the calibrated dates in Table 3. In contrast, Table 1, showing the dated material is unnecessary, and could be either relocated in the supplement or the information about the dated material can be shown in Table 3.

Chronological terminology needs to be revised. It is surprising that the authors use the old terms such as "Atlantic" or "Subatlantic". While these terms have been used in the past, they are not valid any more. One can check the official subdivision of the Holocene epoch from the International Chronostratigraphic Chart. It is important that the scientists follow the names of these officially defined units, to avoid confusion.

Chronological expressions need to be more consistent. Now both "cal y BP" and "BCE" or "CE" are used, which is confusing. The "BCE" and "CE" ages should be indicated as calibrated radiocarbon ages to make them comparable with the rest of the paper.

Figures – the number of the figures is too high in relation to their information content. Figs. 1 and 3 are simple, if not naïve and could be relocated in the supplement. Figs 6 and 7 can be combined to a one figure with a, b and c panes.

Table 1 – as stated, this is unnecessary as a separate table.

Table 2 does not seem to bring any additional information to the study.