

## ***Interactive comment on “Microtopography is a fundamental organizing structure in black ash wetlands” by Jacob S. Diamond et al.***

**Anonymous Referee #3**

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### **1. Introduction**

When talking about primary production and distance from WT, it's a bit odd not to mention drainage of peatlands for forestry which has been thoroughly studied

As the Diamond (referred to at times as "Diamont") et al. in review is a discussion paper, it can of course be referred to, but a link to the paper should be found in the references!

### **2. Methods**

2.1 Site descriptions How were the measurement plots placed in the sites? How far from each other were they? The area variation in the sites is large; is there some correlation between site type and area? These things should be explained in the text

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at least briefly even if they are available in another article.

2.2 Field measurements The WTL monitoring setup should be described in detail already in the methods section - now the fact that WTL was measured in only one location per site(?) only comes up in the Discussion. If indeed WTL was only measured at one location in a site of over 15 hectares, this is quite a problematic approach. The water retention characteristics of peat can vary by a lot based on how decomposed it is and what it is composed of. Also, the water in a peatland system is never at a steady state; it is always on the move and therefore there are always differences in the pressure head inside the ecosystem. This hampers the tests on species richness and basal area, a fact which should be noted in the text.

The fact that the TLS measurements were only conducted on six of the sites should be mentioned already here.

2.2.1 For the species richness, the importance of each microform to landscape level biodiversity would be interesting; even though areas higher from the WTL host more species than those closer to the WTL, their species composition might be closer to that of the surrounding upland forests. This could be discussed.

2.2.2 These two paragraphs are really hard to understand. How were the stand-level metrics for the first data source measured? Is there some reference available?

2.2.3 Why would you air-dry the samples? Bringing moist peat samples to warm conditions is sure to alter their composition, with high microbial activity breaking down organic matter, and nitrification-denitrification processes running wild. This casts doubt on the whole soil chemistry part of the manuscript and should at least be discussed. The different times it takes for the peat samples with different pore size distribution to dry and thus the different amounts of microbial activity that has gone on in the samples will cause the carbon and available phosphate content and nitrogen fractions to differ between the samples.

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2.3 The three-level approach to the dataset is good and the applied statistical methods seem appropriate for each sub-analysis.

3.2 If you take the p-value approach to significance of effects, you should use the wording "no statistically significant relationship".

3.3 The problems with sample processing should be addressed. Bulk density and other physical characteristics representing the state of decomposition of the peat in each location would be useful and potentially another explanation for some of the chemical differences observed.

4. The various problems of sampling and sample processing mentioned above and their effects on the observed results should be discussed here.

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