

Interactive comment on “Towards operational remote sensing of forest carbon balance across Northern Europe” by P. Olofsson et al.

Anonymous Referee #1

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General comment:

This is a well-written and interesting manuscript, which combines data from ground truth and remote sensing to construct a carbon balance model for forested sites in Northern Europe, and I strongly can recommend it for publication. However, some points need clarification or improvements:

Specific comments:

1. The authors shortly describe the dominant species at each sampling site (in Table 1). I have some problems with this, because there is no information about how species dominance was defined. Additionally, nothing is said about structural differences that certainly exist between the sites (species composition of non-dominant species, indi-

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vidual densities, canopy heights, coverages, etc). These factors may significantly influence EVI, and certainly influence all measured biophysical parameters as well (and the authors agree with that on P3157, L11). For instance, one could expect more diverse deciduous forests in northern Germany, and less diverse coniferous forests in Finland. Differences in species composition, diversity, and forest structure thus may explain broader carbon uptake variability in deciduous forests (differing growth strategies!) than in coniferous forests. As there is few information about the different forest types, it is difficult to decide whether the existing data sets are representative for the biomes "boreal forest" and/or "temperate forest", or the ecosystems "coniferous forest" and "deciduous forest" (statements given in the text, as e.g. on P3150, L8-10, are vague and give no information about species composition and structure of the forest sites).

2. I suggest to include a map of Northern Europe showing the location of the sampled sites.

3. P3150, L12-15: needs clarification: in one case, respiration was derived by relationships between average night NEE and night T; in the other case between night NEE and air T ?

4. P3152-3152: I found the different resolutions of NDVI and EVI used at the different sites (250 m, 1 km) confusing. The highly resolved 250m data are not able to detect the seasonal dynamics, but the lower resolved 1km data display the expected seasonal trend clearly ? Needs clarification. In addition, 250m data were only used at Sorø site, because 1 km data detected other vegetation types than deciduous forest. Excluding this site from the data bases may would help to standardize the satellite data sets (all 1 km), which would facilitate the interpretation of the results.

5. P3157, L7-10: The authors mention that one reason for the stronger correlations between EVI and GPP in deciduous sites is that only two sites were considered, whereas five sites were considered in coniferous forests. Is there no possibility to perform stan-

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dards that permit direct comparisons ? In fact, I expected a contrary result: stronger correlations (less variability) between EVI and GPP in coniferous forests, and weaker correlations (more variability) in deciduous forests.

6. Include the r^2 of the exponential relationships in Figs. 6a, 6b, 7, and 8.

Typing errors: P3145, L11: if P3147, L1: "only ON temperature, but on...." P3152, L7: processing P3157, L5: thez P3158, L2: the the

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