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Discussions

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Interactive comment on "Fire intensity impacts on post-fire temperate coniferous forest net primary productivity" *by* Aaron M. Sparks et al.

Anonymous Referee #2

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This is an interesting paper detailing how NPP varies with fire severity across 15 large fires in the western U.S. MODIS satellite data at the 1-km pixel scale was used, giving a coarse view of fire severity effects on productivity. The paper addresses relevant scientific questions, presents novel results, and reaches substantial conclusions. However, some aspects of the paper, both major and minor, could be improved. General and specific comments follow.

General comments:

–Freeborn et al. 2014 reported that differences in per-pixel FRP measured near-simultaneously have a standard deviation of 27%, and that clumping pixels helps a lot (50-pixel aggregation reduces uncertainty to 5%; citation at end of comments). This seems like a relevant issue for the current study, since it uses pixel-level data. Would

including the uncertainty in the analysis change the results or the interpretation of the results?

–I don't find the conceptual framework (page 8 and Figure 4) to be very strong. The authors state that they are linking individual tree-level processes to fire intensity and forest growth and productivity. But they go on to say in the Limitations section that understory vegetation may recover rapidly and make it appear that the overstory recovers rapidly. It doesn't seem that the authors can actually say much about individual tree mortality, given the heterogeneity of fires on the ground, the large size of the pixels being used, and the lack of on-the-ground severity measurements. Couldn't it be that shrubs are what are responding post-fire rather than trees?

–Finally, I agree with the first reviewer in questioning why the authors grouped the FRP and FRE into percentile classes, because then it's difficult to compare actual FRP and FRE in terms of their effect on NPP across fires- you've limited the analysis to within-fire differences. Similarly, I also question why relative NPP rather than absolute NPP is shown in the supplemental figures. Are there are interesting absolute differences among forest types?

Specific comments:

–Page 4, Line 1: MTBS only includes fires 1000 acres and bigger: are the authors able to verify through other data sources that these areas haven't burned since 1984? Does it matter?

–Page 4, MODIS datasets: Was FRP available for all pixels inside the MTBS perimeters?

–Page 5, section 3.1: All of the numbers in this paragraph could go into a table and it might be easier to read.

–Page 5, Line 7: It's mentioned here that other things besides fire may contribute to NPP variability, but I don't think it was mentioned again. It's worth noting in the

discussion whether climate or other factors might play a role in post-fire recovery of NPP.

Technical Corrections: –Page 3, Line 12: Some of the sites are not in the Northern Rocky Mountains. –Page 3, Lines 19-24: Pick past or present tense to be consistent throughout. –Page 3, Line 26: "Canopy cover for each fire"- do you mean pre-fire canopy cover?

Citation: Freeborn, P.H. M.J. Wooster, D.P. Roy, and M.A. Cochrane. 2014. Quantification of MODIS fire radiative power (FRP) measurement uncertainty for use in satellite-based active fire characterization and biomass burning estimation. Geophysical Research Letters 41(6):1988-1994.