

Review of manuscript titled, “Emissions from prescribed fire in temperate forest in south-east Australia: implications for carbon accounting” by Possell et al 2014, Biogeosciences Discuss.

General Comments

This manuscript presents a study of carbon (C) emissions from prescribed fire from a temperate forest in south-eastern Australia. The authors measured emission factors, fuel load, and carbon content for different fuel types from four field sites to estimate direct C emissions after a prescribed fire. They used Monte-Carlo simulations to generate probability density functions of the parameters to account for low quality of data when calculating C emissions. Their results show that the uncertainty in their estimates of C emission declines with declining information quantity and coarse woody debris' inclusion in estimates increases the median C emissions and overall uncertainty in C emissions.

Specific Comments:

Abstract

L1: remove “of” before emissions

L10: effect of what on what? Please rephrase.

Introduction

P13812 L21-24: Check to make sure this is correct, “Return frequencies of wildfires in extra-tropical (temperate) forests in Australia are typically shorter than that of tropical grassland and savanna and are often decadal compared to annual and biannual (Russell-Smith et al., 2007).” I could not find this claim in Russell-Smith et al 2007.

P13812 L24-25: Strange sentence structure, “In addition, and on an annual basis,” please rephrase, doesn't make sense.

P13812 L26-28: “On the other hand, planned or prescribed burning reduces fuel loads in temperate forests is used at moderate return frequencies (e.g. 7–10 years) to mitigate risks to life and property from wildfires (Penman et al., 2007; McCaw, 2013).” Rephrase and look at multiple verbs in this sentence.

What is TC, Tons of C?

P13812, L2: Volkova and Weston (2013) reference is missing from the references.

Materials and Methods

Study sites

P13818, L5: C_{fuel} is defined as “the total mass of carbon contained in fuel that is burnt”, this does not corresponds to the caption of table 3, “C_{fuel} is the initial carbon content of fuel”.

P13818 L1-8: Define DeltaCO₂, DeltaCO, DeltaCH₄, Delta PM and DeltaSigmaNHMC and give units.

P13818 L10-13: Define DeltaX and give units.

P13862, L22: Eq. (4) predicts emissions not emission factors. Is this a typo? Should it cite Eq. (1)?

Results

Table 1 and 2 both have Carbon Content listed but different values and unit. Table 1 shows carbon content varying from 0-1 and it is a unitless number. Table 2 has unit in % dry weight and value is mostly >1. Are you referring to different things?

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Table 3-What is the rationale for assuming the same $\Sigma C_{emit}/C_{fuel}$ for twigs and CWD?

Figure 1 – Change the y axis label to "Proportion of total biomass (%)" because you are showing both pre and post burn measurements. Correct the legend as well.

Figure 2-Describe 7 scenarios, all figures and tables should be stand alone.