

Interactive comment on “Current estimates of biogenic emissions from Eucalypts uncertain for Southeast Australia” by K. M. Emmerson et al.

Anonymous Referee #3

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This paper investigates the biogenic isoprene and monoterpene emissions in Southeastern Australia using the emissions model, MEGAN, and regional chemical transport models. The model output concentrations, and in one case fluxes, are compared to observations made at four field campaigns in the region. Overall, this is a valuable exercise that highlights the uncertainties in the biogenic emission estimates in Australia and highlights the lack of information needed to constrain the current models. This study is relevant to the readers of ACP and is appropriate for publication in the journal. I recommend that this paper be published with minor edits. I provide my detailed comments here.

In the introduction, the MEGAN version 2.1 paper, Guenther et al. 2012, is often referenced (for example, page 1 line 32 and page 2 line4). However, there are earlier papers that introduce the ideas discussed that should be included (i.e., earlier Guen-

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ther et al. papers from the 1990's and the MEGAN version 1 paper, Guenther et al. 2006.).

On lines 23 of page 2, Muller et al. (2008) found overestimates of isoprene. How was this determined, and with what observations?

The outline of the high resolution model grids would be interesting to see on Figure 1.

Page 5: Why were the Acacia species in Australia assigned the lower emission rates?

Page 6, Section 2.3.3: The authors develop a high resolution PFT emission factor map specific to Australia based on an IGBP land cover dataset. Why was this land cover map used? It seems very old, and there are many other more recent land cover datasets available? And is this consistent with the land cover/land use datasets applied in the chemical transport models?

Page 7, line 6: Is the broadleaf evergreen temperate tree PFT in the study dominated by Eucalypts?

Page 8: The authors perform a sensitivity test on the emissions rates. Why (or how) were the factors of 3 for isoprene and 3.5 for monoterpenes chosen? (Lines 27-30).

Figure 1: Which version of MEGAN emission factors are shown here?

Editorial Comments

Page 2, lines 1 and 2: The sentences should read: “all of these processes”

Page 3, line 17: I suggest rewording this sentence: “Two intensive field campaigns took place: SPS1 occurred between ...”

Page 4, line 30: Remove “as” before “per”

Page 5, line 35: I suggest rewording this sentence: “The PFTs listed in Table 2 of Guenther et al (2012) are comprised of various plant species that include high, moderate, low and very low emitters.” I am not sure what the point is of the following sentence,

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and this could be removed.

Page 7, line 30: remove the comma after “dominate”

Page 8, lines 1-2: The wording of this should be changed so that the references identified are properly cited. For example: “Calculated ratios of emitted isoprene to monoterpene carbon were found to be 26.4 for forests in Michigan (Kanawade et al. 2011) and 15.2 in the Amazon (Greenberg et al. 2004).

“Data” are plural (i.e., page 7, line 16; page 9, line 4)

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