

Interactive comment on “Modelling long-term impacts of mountain pine beetle outbreaks on merchantable biomass, ecosystem carbon, albedo, and radiative forcing” by Jean-Sébastien Landry et al.

Anonymous Referee #3

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This study used a process-based model to address carbon and radiation balance of various beetle outbreak patterns and plant communities in stands historically dominated by lodgepole pine. They conclude that impact of MPB outbreak on carbon balance and radiative forcing varied depending on presence and response of non-target plants and report the resulting estimate of radiative forcing. I generally appreciated the clarity and contribution of the study, as I think some of the concepts and general demonstration of how such models can be used would be helpful to forest planners.

Main points:

C1

My understanding is that the model represented competition during regrowth, but that establishment was prescribed. If I am incorrect about that, the authors could possibly try to mention that point early on and perhaps also outline why the model didn't represent establishment. I'm assuming lots of folks would be interested in establishment (in addition to the prescribed behaviours that were explored).

P7-L11: We believe? Wouldn't this be something worth confirming? What is the difference in air temperature, gas exchange, meristem activity, etc? Was there no other comparable literature on these microclimate effects? I seem to recall some good studies on microclimatic responses to clearcut vs. selective harvesting that might be worth comparing against.

Are the chosen prescribed plant community types representative of what is actually happening in response to the 1999- outbreak?

Should potential impacts on regional hydrology be factored into calculations of radiative forcing? Or does actual evapotranspiration and runoff remain stable through these outbreaks?

Were these experiments run under a historical level of CO₂ and N dep., or near future CO₂? Does that influence competition between the PFTs?

Technical:

P1-L11: on the contrary?

P1-L13-14: awkward wording

P12-L4: I was a bit confused by the statement because are other NE species not also being released? I thought there was a lot of subalpine fir coming up. I don't know that release is the contentious issue the authors make it out to be.

P14-L20: You could perhaps add a sentence explaining roughly what Kalb is representing.

C2

Table 1: + symbols probably not necessary.

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