

General comments

The manuscript is well-structured and is written in a concise style. I see a sound scientific construction. The models are validated first, afterwards model scenario runs were performed. The written English needs to be improved here and there. I made some suggestions, however I am neither a native speaker. The following improvements are required:

- it should be clearly stated that only NEP is a 'measurement'. GPP and RE are results of a flux partitioning model.
- parts of the discussion are quite loose
- the conclusions need to be rewritten (see specific comments)
- the results of the scenarios should be discussed against the background of the model quality (validation, Fig. 3), very relevant for the TSE model runs
- please provide more details on how the parameters listed in Table A1 were derived. Which of the parameters were calibrated or even inverted?

Specific comments

2848

6 'three experimental simulations' better write 'The model was validated, scenarios were computed and a sensitivity analysis was performed.'

8/9 'attribution simulations' better use the term 'scenario', this should be used consistently throughout the entire manuscript

11 please add 'tree biomass' before 'residues', or simply use the term 'litter'?

18 replace 'attributable to' with 'driven by'

25/26 replace 'pay back' with 'balance' and replace 'debt' with 'budget'

2849

1-5 Do not understand

10 better write '...Ueyama et al., 2013). Damage by insects had a similar...'

26 replace 'absorption' with 'sequestration' and replace 'clarifying' with 'quantifying'

2851

13 'northernmost' please rewrite

2853 replace 'to correct the problem noted by' with 'according to the shortcoming reported by'

18 The time series climate data for Tomakomai (2001-2003) is very short. Climatic data should cover a period of 20-30 years at least. If those 3 years are not representative of the local climate the spin-up equilibrium result will be biased.

26 'from the first year of observation' ? do not understand

2854

5 add 'the' before 'blizzard'

6 replace 'exported' with 'removed'

7 please write '..., 55% of the stems were ...'

8 replace 'in' with 'on the'

10 replace 'manner' with 'details'

14 'mixed' instead of 'mix'

17 replace 'general manner' with 'common practice'

18 I suggest 'Management and climate scenarios' as title of section 2.4

26 replace 'exported' with 'removed'

28-30 this list of variables with subscripts is not very intuitive. Please explain in more detail

2855

7 better write '... the ecosystems turns into a carbon sink in the recovery...'

24 replace 'exported' with 'removed'

2856

8 well, the EC-based determination of NEP could be referred to as a measurement.

However, GPP and RE are basically estimates derived by a very simple model from the NEP (see 2852, line 13). Thus, for GPP and RE you compare VISIT model results to other model results and not to observations.

13 I guess it is important to mention at this point that the R² for NEP (Fig. 3) differs substantially between the three sites/periods. The R² for both periods of TSE is quite low (about 0.5), whereas for TMK you have a nice R² of 0.9. Please discuss...

19 replace 'derived from' with 'estimated by'

2857

4 significant bias (deviation from the 1:1 line) is visible for some models in Fig. 3, please discuss

10 title...

21 skip 'we found that'

2858

1 skip 'at'

16 replace 'these' with 'the corresponding'

2861

26 skip 'it' and write 'observations'

2862

3-7 three times 'via' in this section, please reformulate

14, 15 and 24 'whereas we found the opposite', '...', also in contrast to our result' and ...'which was the opposite of our results'; discussion is a bit loose here. You often mention what is not in agreement without expressing an idea of the reasons for the disagreement.

2863

10 drought will not only affect GPP, but also RE. Heterotrophic respiration is sensitive to soil moisture.

26 replace 'faster' with 'shorter'

2864

6-24 skip this section, this is not related to the results of this study

2865

2-6 I suggest to skip. This section is weak, mostly common knowledge and hardly related to the results of this study. Conclusions need to be rewritten.

Table 2 better use 'yes' or 'no' instead of 'occur' and 'not occur'

Fig 5 upper x-axis label: better write 'years after clear-cutting...'