

## Review of 2<sup>nd</sup> revision: EGUSPHERE-2023-1216

The authors have done another good job of responding to reviewer comments. I have some more comments in response to their revision, again all minor, and fewer than before.

- Fig. 1 caption: “After 1 year the wood from a storm is not fresh enough for bark beetles to breed in, so  $i_{hosts\_dead}$  goes to zero.”
- Table 1:
  - Alphabetize
  - Add  $i_{rd}$
  - Inconsistent variable capitalization (here and in text)
  - Inconsistent use of underscores vs. spaces in subscripts (here and in text)
  - Add “susceptibility” to description of  $I_{hosts\ health,age\_class}$
- L273: “the max” should be “the maximum”.
- L277–281 (Eq. 5b):
  - I’m afraid the added information about age classes just served to confuse me further. I think it should be reworked like this?

$$PWS_{max} = \sum_{a=1}^3 \max(PWS_y, PWS_{y-1}, PWS_{y-2})_{spruce} \times \frac{F_{spruce,a}}{F_{spruce}}$$

where  $a$  is age class and  $y$  is the current year. (Similar changes should be made for Eq. 6b.)

- L280: Also mention that PWS is 1 when plants aren’t stressed at all.
- L452: “index of weakened trees index”—delete second “index”
- Fig. 2
  - Caption: Refer the reader to Table 1 for variable name definitions.
  - Rounded rectangle whose left side comes between, e.g., PWS\_max and the “5” arrow should be deleted. It breaks the connection between the variables on the left and the arrows on the right, and it doesn’t seem to add anything useful to the figure.
- Table 3 caption:
  - “spacity” should be “sparsity” or (preferably) “scarcity”.
  - “but see table s1”—why “but”?
- Table 3: “A severe bark”—delete “bark”.
- Sect. 3.4:
  - Note that scores are either 0 or 1.
  - “is the sum of four scores” isn’t quite right, since that sum is multiplied by score5.
  - Discussion of “four scores” in first paragraph and bulleted list neglects score5—why?
- Sect. 4.2: Refer to Table S1, but note that it only contains the variables from Table 4 that were sensitivity-tested.
- L724: What is the “t” in this sentence?

- Table 4: Please alphabetize.
- Sect. 5.3: Previously, I requested: “Discussion (and also Conclusion) should mention that this depends on spatial scale and model use. If one is looking at global-scale NBP, there might not be as much of an impact of including abrupt disturbances because they’re happening constantly somewhere.” The authors replied that a spatial analysis is the focus of their next paper, not this one. That’s fine, but the point I raised should still be mentioned here. It’s fine to say what the paper plans are as well, if the authors would like.
- Line 804: “locations” should be “location” (or just deleted)
- Supplementary figures and tables: S in numbering should be capitalized. (E.g., S4, not s4.)
- Figs. S2-4 have the same caption. They seem to differ only in the variable being plotted on the Y axis, so please add that information to the caption. Then the captions of Figs. S3 and S4 can be simplified by saying something like “As Fig. S2, but for total biomass.”
- Throughout main text and supplement:
  - “access” should be “assess”
  - “developpement” should be “development”

### **Table S1**

Red/green is not colorblind-friendly. Other colors would be better, but avoiding color would be best. It’s also confusing because some of the green values are also reference values, which should be black.

Here’s one suggested setup that would be clearer and more accessible: Italics to indicate “reference values” (which would more clearly be referred to in the caption as “variables held constant for each sensitivity test”), underlines to indicate values of sets scoring 4, and bold to indicate the values ultimately chosen. See screenshot below.

	S_generation	G_limit	S_activity	act_limit	S_susceptibility	i_rd_susceptibility	S_mass_attack	BP_limit	Score
Set 1.1	1	0.5	-20	0.06	-5	0.55	-30	0.12	4
Set 1.2	5	0.5	-20	0.06	-5	0.55	-30	0.12	2
Set 1.3	500	0.5	-20	0.06	-5	0.55	-30	0.12	2
Set 1.4	1	1	-20	0.06	-5	0.55	-30	0.12	4
Set 1.5	5	1	-20	0.06	-5	0.55	-30	0.12	4
Set 1.6	500	1	-20	0.06	-5	0.55	-30	0.12	2
Set 1.7	1	1.5	-20	0.06	-5	0.55	-30	0.12	3
Set 1.8	5	1.5	-20	0.06	-5	0.55	-30	0.12	0
Set 1.9	500	1.5	-20	0.06	-5	0.55	-30	0.12	0
	S_generation	G_limit	S_activity	act_limit	S_susceptibility	i_rd_susceptibility	S_mass_attack	BP_limit	Score
Set 1.1	1	0.5	-20	0.06	-5	0.55	-30	0.12	4
Set 1.2	5	0.5	-20	0.06	-5	0.55	-30	0.12	2
Set 1.3	500	0.5	-20	0.06	-5	0.55	-30	0.12	2
Set 1.4	1	1	-20	0.06	-5	0.55	-30	0.12	4
Set 1.5	5	1	-20	0.06	-5	0.55	-30	0.12	4
Set 1.6	500	1	-20	0.06	-5	0.55	-30	0.12	2
Set 1.7	1	1.5	-20	0.06	-5	0.55	-30	0.12	3
Set 1.8	5	1.5	-20	0.06	-5	0.55	-30	0.12	0
Set 1.9	500	1.5	-20	0.06	-5	0.55	-30	0.12	0

Caption:

- “ips typographus” should be “*lps typographus*”
- “The parameter set in green”: “set” should be “sets”.
- “32” should be “36”
- What does “selection” mean here?