

Specific comments

- 1) L80: Reference to Figure 1: In Fig. 1 you first mention the virtual trees, which have so far not been defined. The caption needs to ensure that the figure can be understood. Add a brief statement on the virtual tree concept and where more information can be found in the manuscript. In addition, the term "maximum virtual tree" is not explained anywhere and only used in Fig. 3 besides here.
- 2) L145-L170: Same issue as above: Fig. 3 is referenced, which requires understanding the concept of virtual trees but virtual trees have not been introduced to the reader and there is no information where their definition can be obtained.
- 3) Caption of Fig. 3: "maximum virtual tree" not clear.
- 4) Section 2.2: I recommend to insert a separate (sub-)section on the virtual trees or at least mention the term in the section title, which would make it easier to point readers to this. I.e., rename section 2.2 to e.g. "...and addressing them using a concept of virtual trees" and/or split this section into (a) challenges and (b) the solutions proposed in this manuscript.
- 5) L201/L216 etc.: remove "across many sites". An ideal model would have this behavior across all sites.
- 6) Section 2.3 (ii) and Fig. 5: How is the cut-off time period (last ten decades) determined? Section 2.3 (iii) has a thirty year time period and it is mentioned that this may be arbitrary.
- 7) L373: I don't understand the reference to Fig. 9 here. Wouldn't Tab. 1 be more appropriate to show the 88 test cases?
- 8) L380: 72% is not correct anymore as apparently results for site SOB have changed from 0.001 to -0.001 since the last version of the manuscript, which would increase the rate to 77%.
- 9) L386: Aren't there additional sites that have a positive change?
- 10) Figure 7 legend: "Simulated biggest output" not clear

- 11) Supplement L348: Table S3 does not provide information on "issues of the ITRDB"
- 12) Supplement L384: "longer" -> "older"?
- 13) Supplement L388: "XX mm"?
- 14) Supplement L412: "biggest simulation" not clear -> "largest simulated diameter class"?