

Earth Syst. Sci. Data Discuss., referee comment RC1
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Comment on **essd-2021-77**

Anonymous Referee #1

Referee comment on "Mapping global forest age from forest inventories, biomass and climate data" by Simon Besnard et al., Earth Syst. Sci. Data Discuss.,
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The forest age is a variable measurable in those forests subject to stand-replacing disturbances only, which are:

- fires (only in those forest types where fires determine the total loss of biomass, e.g. conifer forests (especially in boreal climate),
- clear-cut (although this management option is increasingly limited to some forest types only (in particular conifer boreal forests),
- pest may also determine a complete loss of forest biomass.

Other forest types and management systems do not qualify the biomass stock with an age, and the artefact assignment of an age-value may determine biases in the derivation of other variable considered to be associated with the age e.g. biomass stock, biomass growth rate.

The suggested way forward is to:

- identify those forest types where stand-replacing disturbances occur and map those
- use as datasets all data-points for which the age from the last stand-replacing event has been established with certainty from the latest registered stand-replacing disturbance (e.g. not just extrapolated from the biomass stock present).

This means that all data points for which the age has been derived from the biomass stock level only have to be excluded from the analysis; unless have been collected in those forest types likely subject to stand-replacing disturbances (e.g. forest fire in boreal forests); which means that for most of the boreal conifer forests such age derivation from the biomass stock may be done (although for instance it cannot for boreal rainforests, unless subject to clear-cut).

- apply the methods described to identify the most significant variables to extrapolate age to those forest land for which age data are available
- assign an NA to those lands for which an age-value cannot be assigned with certainty, e.g. all rainforests not been subject to clearcut.