

Biogeosciences Discuss., referee comment RC1
<https://doi.org/10.5194/bg-2021-120-RC1>, 2021
© Author(s) 2021. This work is distributed under
the Creative Commons Attribution 4.0 License.

Comment on bg-2021-120

Anonymous Referee #1

Referee comment on "Persistent impacts of the 2018 drought on forest disturbance regimes in Europe" by Cornelius Senf and Rupert Seidl, Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-120-RC1>, 2021

This is a highly relevant study, as it addresses spatial and temporal forest disturbances in continental Europe in response to the extreme drought in 2018. The authors draw some important conclusions of the 2018 drought being a lasting trigger of changes in forest disturbances across Europe. While I find this finding very fascinating and relevant, I would wish that the authors could underpin it further. Particularly, the link of low soil moisture/high VPD in 2018 being a main driver of forest disturbances in 2019/2020 should be made clearer. I am convinced that this will increase the relevance of this letter and make it attractive for a large scientific community. My main comments are:

- Please define forest disturbance (in the context of your study).
- Please clearly explain all the components that are considered as disturbance and what degree of forest cover loss is needed for a disturbance to be detected with your RS approach.
- Was disturbance severity assessed (as in Senf & Seidl 2021)? And if yes, should it not be included in the analysis?
- I think it would be good to understand how an already disturbed area/pixel is treated in the following years post disturbance. Are disturbed areas/pixels considered in the next year of your analysis, e.g. from 2019 to 2020 and do they add to the disturbance rate (e.g. because they are more disturbed the next year) or are they omitted because the forest was already disturbed?
- I think it would be worth to assess potential impacts of low soil moisture and high VPD in 2019 on forest disturbance rates. Eventually it was not the one event in 2018, but a repeated drought/heat that increased disturbance rates... This should be at least check and the results presentend.

Further specific comments:

L32 Why is your approach rapid? Did you left something relevant out?

L40 Did you check the soil moisture/VPD anomalies in 2019, in many regions this was a dry and hot year. Particular two subsequent dry years might have been the trigger for disturbances to last. Could you add some additional analysis/ information on this, please?

L42 To my feeling explaining 11.5% of forest disturbance is not that high, or? Please add some explanation.

L57 Can you please add some information on how strong the disturbances were (e.g. stand replacing, 50% of forest canopy lost,...)?

L61-62 But you did not directly assess canopy mortality rates, or?

Fig 1. Do the presented forest disturbance anomalies per year include the previously disturbed forest patches or were those patches excluded? And how was an increase in disturbance severity addressed?

Fig 2 Is this 1% sample an exceptionally good one or was it randomly selected? And do the regression represent all data or the 1% only? I think the summer VPD anomaly is given for 2018. Please add and make this clear in the Figure caption and legend. Please also check the unit for VPD, an anomaly of 5 kPa seems huge, did you mean 0.5 kPa instead?

L124-125 Add the corrected numbers from your Nature Sust. author corrections.

L 156 Please add a citation/link for the ECMWF reanalysis data. Could you briefly mention how well ERA5 represents soil moisture?