Dear Associate Editor,
Thanks to the very useful comments of the reviewers, we improved the clarity of the manuscript and in particular the Introduction section and the justification of the selected biomes. The modifications can be found in red font in the track-changes file.
Thank you for your additional comments. Please find below in blue font our answers.
Moreover, we would like to inform the first reviewer (Dr. Chaparro) that after an investigation on several GDAL resampling methods, we decided to use a weighted average filter, for all datasets. Indeed, this resampling method is the most precise one to keep all contributions, and the results are quasi-identical to our previous method. We would like to thank Dr. Chaparro for raising this issue.
Best regards,
Emma Bousquet et al.

Dear authors,

Thank you for addressing the reviewer comments. As you can see, they each had a number of major concerns about the paper fully before publication can be considered. Please proceed to uploading the revised manuscript for re-review.

In addition, I have a few additional comments:

1) Like Reviewer 2, I had some trouble really understanding the goal of the study based on the somewhat meandering-introductions. From the list of planned individual changes it is difficult to assess how this will change, but please do try to ensure the objective of the study is clearly described and motivated.

We agree that the introduction was too general and did not emphasize the purpose of the study. We tried to simplify it and added the suggestions of both reviewers in order to focus on the objectives of the study.

2) In addition, it seems like it would still be possible to study post-fire recovery in areas that burn seasonally, just only by consider the recovery process on sub-annual timescales. Given the large number of areas with regular fires that are now not considered in what is profiled as a global study, why not add such an analysis?

In this study, we wanted to investigate the vegetation recovery in the long term, because fires can damage vegetation for many years in terms of AGB, as described in the introduction (Barlow et al., 2003; Silva et al., 2018; de Faria et al., 2021).
Moreover, a sub-annual study would be difficult to lead at the monthly timescale. We use here monthly averages of data in order to smooth rapid variations of VWC in VOD, as you are well aware (Konings et al., 2021).
Nevertheless, a sub-annual recovery study could be performed over seasonally burned areas in the future, by using daily or weekly data.

3) Given the dense vegetation in Santarem, is the soil moisture there really reliable?

Thank you for this very relevant comment. Soil Moisture measurements under dense forests are uncertain because of the lack of representative reference data for validation, even though Colliander et al. (2020) recently demonstrated that spaceborne L-band radiometry is indeed sensitive to soil moisture under forest canopies. We added TWS and precipitation data in order to support SMOS SM observations. Over Santarem area, no significant SM decrease is visible during the fire (Fig. 3c), while TWS and precipitation show a strong deficit. This surprising observation could be explained by the high uncertainties of SM under dense forest. We stated at line 312 : “Surprisingly, SM stayed stable during the fire.” but we did not discuss this observation in the discussion. A sentence was added in that sense : “Contrary to TWS and precipitation, SM stayed stable during the fire, maybe because of the reduced accuracy of SM measurements under very dense forest."

4) Can you add a sense of the spread across pixels to Figure 5? This should help contextualize the differences between sensors.

In Fig. 5, we show a mean anomaly time series over each biome (669 points for grasslands and croplands, 591 points for savannas and shrublands, 387 points for needleleaf forests, 79 points for sparse broadleaf forests, and 66 points for dense broadleaf forests). We chose to plot only the mean value without the dispersion because the resulting figure is illegible. An example is provided in Fig. R1 below for the dense broadleaf forest biome. The dashed lines represent the standard deviation. This information is interesting but the resulting graph is very heavy. Nevertheless, in order to provide an insight of the dispersion across pixels, we plotted the standard error of the mean of the measurements on Fig. 6 and Fig. 7.

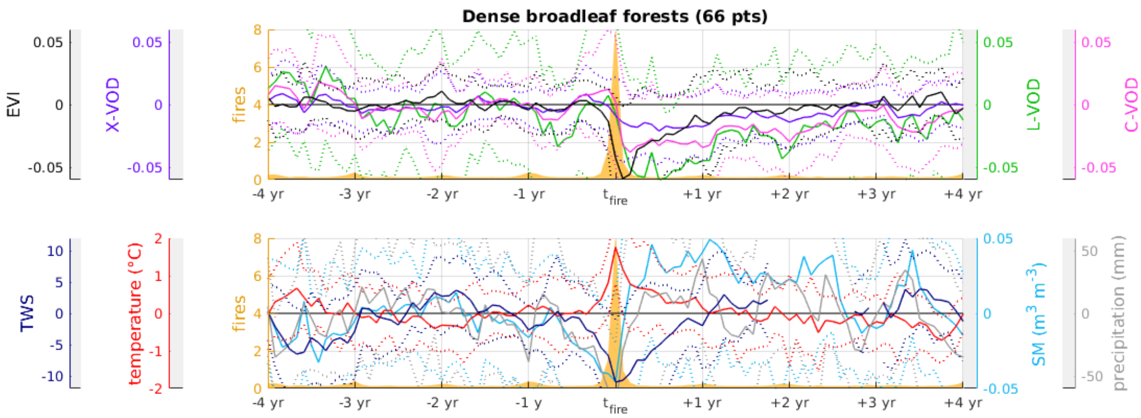

Figure R1 – Time series of the number of fires, and anomaly time series of EVI, X-, C-, L-VOD, P, SM, TWS, and T, shifted on the fire date, for the dense broadleaf forest biome. Continuous line : mean value. Dashed lines : mean value +/- std.

5) Lines 461-462. Blaming the behavior of dense broadleaf forests in Figure 7 on a lack of fire-adaptation without further evidence is a big jump in logic. Aren't these anomalies more likely to be larger just because the mean VOD in these ecosystems before fire is larger?

The Associate Editor is right that different biomes are compared in Fig. 7, and that the mean value of VOD (and of other vegetation variables) is higher in dense forests. We found mean L-VOD values of 0.79 in dense broadleaf forests, 0.64 in sparse broadleaf forests, 0.61 in needleleaf forests, 0.36 in savannas and shrublands, and 0.21 in grasslands and croplands, in average over the considered points.
We tempered the corresponding sentence as follows : "We also found that the dense broadleaf forest biome was the most impacted by fire (Fig. 7), because the absolute values of vegetation variables before fires are higher in this biome, and because it is not a fire-adapted ecosystem (Cochrane, 2003).".

Best regards,
Alexandra Konings

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