

Comments to the author:

Dear authors,

Based on my reading of your manuscript, the reviews and your responses to the reviews, your manuscript has high publication potential.

Some remaining issues (see below) need to be addressed and will be reviewed by me.

Best,

Sander Veraverbeke

Major comments:

Lines 144-145: The suggested images searches pre- and -post-fire over a period of 100 days will likely result in pre- and post-fire values that represent different phenological conditions. This is a major limitation that needs to be addressed. Why not try to search for pre- and post-fire images near 'anniversary date' windows?

R: Thanks for the comment. This issue is one of the limitations when working with Landsat. In the best scenario, we can have 16 days difference between a fire event and post-fire image. However, time-lapse depends on the date and duration of the fire and the quality of post-fire image (clouds and shadows). Considering this, we select the best pixels at moments as close as possible after a fire event sorting the image collection by the date with a maximum limit of 100 days. We consider the anniversary date a possibility, but we discarded it because of vegetation recovery or tree or crop replanting in productive lands. In addition, in Chile there is still salvage logging a legal management action after fire, that could severely affect the post-fire land cover spectral response. Considering that the maximum time between the event and the next image could be a limitation for some places, we make explicit in the text that this decision could be taken locally.

L 147: However, the definition of the maximum period of time must be chosen, taking into account local phenology, vegetation recovery, or landscape dynamics, aspects that could change the spectral response of the land surface after a fire.

Lines 171-172: the interactive visual interpretation process to decide fire-by-fire on a RdNBR threshold is a serious limitation. These reviewer comments have not been sufficiently addressed and I highly recommend thinking about automating the process. Could (R)dNBR histograms of known unburned pixels in your time series be helpful to decide on objective thresholds? Possibly, such a threshold could be spatially and temporally variable.

R: Thanks for the comment. We are now working on automatizing this process; however, we need an initial visual interpretation of this threshold because it changes depending on the vegetation type affected by fire, date, severity, and other conditions until unknown for Chile. The visually interpreted boundary of the fire gives us the "ground truth" for validating our future development. Comparing the distribution of RdNBR in a burned and unburned site is a good start, but we still need this validation data done by the interpretation from the human eyes. Deep learning technics as an Artificial intelligent model is a promising approach that tries to imitate our brain's image interpretation. However, the models still need training images obtained from this "ground truth" data.

Lines 210-211. The reduction from 194 to 78 fire scars needs to be justified (as requested by one of the reviewers). Please explicitly state the reasons of the omissions, and the number of omitted fires for each reason.

R: We clarify in the text.

L212: The author generated 194 fire scars, of which 78 coincided with two criteria for making comparisons: (i) individual fire scar must be at a distance of at least 300 m of another reported fire by Brull (2018), and (ii) the fire have the same name, start date and control of our seed data to avoid confusion. From 194 fire scars collected by Brull (2018), 107 were within 300 m from another reported fire, and in nine cases, the name and dates did not match.

Minor comments:

Lines 64-70. Would be good to include some recent efforts here based on Sentinel-2 data, for example:

Ramo, Ruben, et al. "African burned area and fire carbon emissions are strongly impacted by small fires undetected by coarse resolution satellite data." *Proceedings of the National Academy of Sciences* 118.9 (2021): e2011160118.

Glushkov, Igor, et al. "Spring fires in Russia: Results from participatory burned area mapping with Sentinel-2 imagery." *Environmental Research Letters* 16.12 (2021): 125005.

R: We included.

Line 104: Km2 should be km2

R: Corrected

Line 119: please remove 's for database

R: Corrected

Lines 403-404: 'Different burned-land covers may have variable RdNBR values, but this relationship does not figure among the objectives for the present database development.' Somewhat awkward statement, I suggest removing.

R: Removed

Line 430: 'FIRMS': you are referring to the VIIRS active fire data here, please rephrase.

R: Corrected

Figure 4. Lat/lon labels are too small to read. I recommended adding them with larger font size to the top left map figure, and removing them from the other maps. I also concur with reviewer 3 that it is recommended to use South & West in the latitude & longitude labeling, rather than using negative values.

R: Corrected. We change lat long for South and West for Fig 2 and 5. Fig. 4 doesn't have coordinates.

