The approach to studying effects of tephra deposition on vegetation using earth observation data available in digital archives is interesting. It offers new opportunities for complementing in situ observations and experimental studies of tephra effects. There are numerous caveats involved in such an approach, and the authors have listed most of these. However, among the issues that limit the interpretability of multispectral images to estimate tephra impacts, the following aspects should be given more attention:

- Vegetation structure: the three-dimensional structure of the above-ground parts of vegetation, the physical rigidity of the above-ground parts and the ability to resprout if buried under tephra are aspects which are likely to be relevant for estimating resilience of natural vegetation as well as agricultural crops. Given the low thematic resolution of the currently available data products such as those based on MODIS images, considerable uncertainty has to be expected, and reducing this will be a key challenge for integrative approaches that bring together remote sensing, field studies and experiments.

A relevant reference in this context is:

- Variability of physical and chemical characteristics of eruptive events: the relative importance of physical and chemical components in the impact of volcanic eruptions on vegetation and farming systems has been discussed for some time (see references listed below), but with the limited evidence available, no consensus has been reached. Gaining a better understanding of these aspects will be a prerequisite for utilizing remote sensing approaches in the development generalizable models of volcanic impacts.


- The role of timing of eruptions in relation to phenological stages of natural vegetation
and agricultural crops: there is some evidence for the relevance of the timing of tephra impacts on vegetation responses, e.g. from observations after volcanic events and from experiments.


In this context, the statement in line 159 'tephra on crops perturbate plant phenology' is not ideal; tephra deposition can affect plants differently according to the phenological stage, and the magnitude of the impact determines whether subsequent phases in the phenological development are significantly disrupted or not.

The use of indicators to quantify and communicate tephra effects on vegetation should be considered carefully. The Cumulative Difference Index depicted conceptually in Figure 3 is not intuitive in the sense that it keeps decreasing even if the state of the vegetation under consideration is stable, a stable, negative value indicates recovery of the state prior to disturbance, whereas a return to the value prior to the disturbance event requires the underlying vegetation index to exceed the values during the baseline period. Although it is useful for determining the minV and minT values used in the modelling exercise of this study, for communicating the actual processes observed in the vegetation, using vegetation indices would be more accessible to a wider audience.

The text is generally well-written and the figures are largely clear, but some copy-editing is necessary.

Line 32 datasets open -> datasets and open

Line 125 Figure 1 It would be helpful to link the legends to the respective parts of the figure. Are all the listed climate types represented on the map? It seems that the legend could be simplified somewhat. Mean annual precipitation is by definition cumulative; this should also be corrected in the figure caption.

Line 145 of entire region -> 'an entire region' or 'entire regions'
three different ecosystems: At this level of spatial classification, 'biogeographical region' seems more fitting than 'ecosystem', which is usually described based on more detailed biological, chemical and physical criteria.

'precipitation' is uncountable; please check and correct throughout the manuscript

identified from literature -> identified from the literature

Here are presented the final set of variables -> Here we present the final set of variables

Please quantify what you mean by 'a minimum degree of relations'

an iteration -> iterations

Beck et al., (2018)'s updated 1-km version of the Köppen-Geiger climate classification -> the updated 1-km version of the Köppen-Geiger climate classification by Beck et al. (2018)
Line 800 facet of risk -> facet of risk assessment and management