Revision

To

Dr. Fernanda Cerqueira Vasconcellos

Universidade Federal do Rio de Janeiro,

Instituto de Geociências

Editor of the

Anuário do Instituto de Geociências

Dear editor,

Please see below (in blue) the answers to the reviewers comments regarding the submitted paper “Soil-vegetation Parameters Variability in the West Region of Santa Catarina State”. I approached each comment and a new manuscript version is now submitted. In this new version I used the "Track changes" tool of "MS Word".

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Reviewer A:

1. Review whether it is appropriate to use the parameters in your work. I think it would be more appropriate to use variables. For example, when you used soil parameters I expected to find field capacity and wilting point in your text, but this was not the case.

**R - Parameters was replaced in the text and the new title is now “Soil-vegetation Variables Changes in the West Region of Santa Catarina State”**

2. Make your purpose clear at the end of the introduction, and your introduction should be clear regarding your contribution to science.

**R - An improved introduction is now provided in the new version of the manuscript.**

3. Its introduction should be more detailed, justifying the choice of methods and clearly defining for the reader which period each analysis was performed.

**R - An improved more detailed introduction is now provided in the new version.**

4. Use standard units for your variables, eg evapotranspiration is commonly treated in "mm" not kg.m-2.s.

**R - Precipitation and evapotranspiration units (kg/m^2) were replaced to mm in the new version as they are equivalent.**

5. When making a claim in your results, have it backed up by the literature or statisticians.

**R - Since there is no other studies for this region, there is no literature available. Therefore, the focus was on the results for this particular region, mainly based on the obtained data time series. Although, there is a discussion as in the conclusions for the latent heat impacts of clouds (Ramos-da-Silva et al., 2008) and the GRACE studies on the depletion of subsurface water analysis for other regions (Vasco et al, 2022; Castle et al., 2014; Rodel et al., 2009).**

6. Produce quality figures and format them correctly, so that the reader can quickly extract the mentioned information in the text.

**R - Improved quality figures for the time series are now provided in the new versions to better explain the results.**

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Reviewer B:

 The authors presented an interesting study about the spatial and temporal variability of soil-vegetation parameters over the state of Santa Catarina (SC), Brazil. The temporal variability was focused on a particular region of the SC around the city of Xenxerê. Better reasoning should be provided why the region was chosen in the Introduction Section, which is, as it is, more focused on the methods than the problem itself. In the study, the authors made use of relevant, modern, and freely available remote sensing/modeling

methodologies to gather data for the research. The presentation of the Results is somewhat confusing. The author intermingles the spatial distribution of climatological variables over the state of SC and the time series of the soil-vegetation variables in the Xenxerê region in the paper

structure. I would imagine that exploring one and, sequentially, the other would make the discussion more fluid. The time series are presented in the form of anomalies. However, no explanation is given for how the anomalies are calculated. Are they anomalies over the ensembled-averaged monthly data? I believe so but it should be stated. Additionally, I believe that the presentation of time-series actual values, not only the anomalies, would be relevant for the discussion, at least for evapotranspiration, such that the

reader has a better understanding of the seasonal patterns. Even though the analysis seems proper, the discussion is somewhat factual. I think that the data could be better explored with deeper discussion, maybe using time series tools such as Fourier or wavelet analysis, to get a better

understanding of the dynamics. However, the paper is well written, relevant and within the scope of the ANUÁRIO DO INSTITUTO DE GEOCIÊNCIAS IGEO/UFRJ.

I would recommend publication with major changes.

Specifics:

- The Introduction section is more of a description of the remote sensing and modeling tools instead of a description of the research question the authors are addressing. The specific problem, which is the variability of soil-vegetation parameters variability in the SC region, should be better

explained in the Introduction. Why the study is important and, in particular, in this region? The authors should include this information at the end of the Introduction section as they mention in the Abstract.

**R - An improved introduction is provided in the new version of the manuscript.**

- The authors state that “Recent studies show that monitoring the sub-surface…” but cite just one, Vasco (2022). More references should be included to support their claim or change the statement, maybe providing insights found by Vasco (2022) using the methodology.

**R - Other studies were included in the manuscript: Rodel et al.(2009), and Castle et al, (2014)**

- Results and discussion should follow a sequence, spatial distribution first, and then time series, given that they are for different areas.

**R - Results and discussion now follow a sequence from spatial and then time series in the new version.**

- Anomalies calculation should be explained and actual values for the variables such as evapotranspiration, precipitation, and soil moisture should be provided for a better understanding of the seasonality.

**R - A description of anomalies is now described in the new version. The anomalies are provided as a product by the FLDAS program and are computed as described below.**

**“The FLDAS data for monthly anomaly and monthly**

**climatology products are derived from the monthly data. The**

**monthly climatology data are generated from the monthly data, as a 35-year (1982-2016)monthly average. The monthly anomaly data are generated by taking the difference between the**

**monthly data and monthly climatology data for each grid point. This difference represents how the given month compares to the 35-year climatology.”**

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