Thank you for your comments and positive feedback on our manuscript. Your comments have helped us to improve the quality of the manuscript. Provided below are responses to your comments.

Best regards,

The authors

Major comments

1. One of the problems with the analysis/methodology is that one of the variables used to understand feedbacks between vegetation and climate is API. API is defined in the paper as antecedent Precipitation index (computed using equation (1) in the text). The rationale for using this variable is that it reflects "soil moisture". Though this is a reasonable assumption, and the value of API can be obviously assumed to exert an effect in vegetation, it is less clear that API can be considered a climatic variable, and used to study the effect of vegetation on "future climate" (see further comments in points 3 and 4). Please note that equation (1) is equivalent to using the following equation: APIJ = sum (KiPJ-i) (which is a weighted average of previous values of Precipitation). Because of the high value of K, the value of API has a strong dependence on past values of P, which affects past values of LAI. Note also that the use of equation 1 induces a high correlation structure in API. Therefore LAI(t) a significant correlation with API(t+1) is not surprising. I think that the authors should use P and not API in the analysis (or at least in the lead LAI analysis), particularly to infer the impact of vegetation in future climate (it will obviously have an effect in soil moisture!, the important question is whether it will have an effect in climatic variables like P.

Response: The authors agree on the potential influence of using lagged precipitation on the correlation analysis with LAI. Consequently, monthly precipitation data is used in the revised manuscript for the correlation and feedback analysis.

2. Methods: Section 3.2.2 is very unclear :
   2.1 The authors state: "A random sample encapsulating 25% of the total pixels was then selected after removing NoData cases resulting to a total of 7,179 data points." This statement is not explained, what are the NoData cases? How were they selected?

   Response: The NoData cases represent areas covered by water bodies as well as those classified as barren/bare in the land cover data. The sample therefore represents a random selection of 25% of the pixels with vegetation cover.
   2.2 Why is the data aggregated seasonally?

Response: In this section of the analysis, the authors' interest was to show spatial dependence in the LAI-climate relationship. The data was therefore aggregated to the main seasons in the region. The MAM season considered for the dependent variables is the main rainy season in the most of the study region.

2.3 Why/how are these four models selected? Is it an arbitrary choice?

Response: The selection of these models was motivated by the need to assess the spatial effects in the API-LAI relationship. However, in order to address the concern on the use of API instead of precipitation, the models have been revised to replace API with precipitation data.

2.4 What are models III and IV trying to show? Are these supposed to be models for predicting API? Please note that as API represents a weighted average of the history of precipitation (and not precipitation in The MAM season), these two models loose meaning.

Response: Models III and IV are aimed at showing the spatial effects of vegetation on API while considering the additional influence of temperature. Particularly in model IV (which includes API for DJF season as an explanatory variable), the aim was to include the effects of moisture during previous season on the moisture for the current (MAM) season. The revised manuscript will provide more analysis on the spatial variations of the coefficients for the different variables.

2.5 The choice of variables in equations I to IV should be physically explained. In addition to explaining why you choose these combinations of variables for this equations (i.e., the question in the previous point), you should also explain what does each equation explain in terms of physics, or equivalently, the physical interpretation of the results. It seems that probably, looking at equations III and IV and based on the coefficients given in tables 2 and 3, that adding LAI for DJF will enhance the results for equation I and II, so why not doing this? What are you trying to capture in these equations?. The selection of variables seems arbitrary, and no attempt to explain the selection has been made. It is therefore no surprising that the results from this analysis are a bit vague (section 4.3.2, see also next point on the results of models III and IV).

Response: We agree with the reviewer on the need to include an explanation for the choice of the models. The revised manuscript will also provide an improved discussion section.

3. An additional problem with the use of API appears when looking at the spatial regression analysis (section 3.2.2.). The problem mentioned in point 1, is exacerbated in the analysis and interpretation of results from Equation IV. Please note that the very high regression

coefficient presented in table 2 for the OLS and GWR models are partially capturing this problem. The "history of precipitation" is directly correlated to the values on the previous three months (it has been computed using those values!), leading to the obvious result described in page 13, lines 5-6 that state "API DJF" is the most significant explanatory factor in API MAM (please note that this directly comes from the use of equation 1!, the equation is ill posed and the correlation is forced into the equation). Please also note that the interpretation of the results from model III are also affected by this problem. Any results based on API, as API has strong autocorrelation and therefore, it is not surprising that will show high correlation with variables, in particular LAI in previous time steps, without meaning that vegetation is impacting future precipitation.

Response: The authors agree on the potential effects of using API as computed in our study for lead/lag correlation and vegetation feedbacks analysis. Our revised analysis therefore utilizes z-scores computed from monthly total precipitation and LAI data for both vegetation-climate correlation and feedback analysis.

4. Figure 7a. As explained in earlier points, the results presented in Figure 7a are not surprising, due to the definition of API. It is not clear that this strong correlation suggests a vegetation influence on (future) Precipitation, as it might just reflect a strong correlation with past precipitation amounts. Here, an analysis of LAI lead on precipitation (not API) would be more meaningful, as done in previous work cited in the paper (for example: Li et al. 2006, Hoscilo et al., 2015, Notaro et al., 2006).

Response: The revised analysis will address this concern as indicated in the response for point 3 above.

5. The discussion section in pages 13-14 is very unclear. The text is not clear partly due to poor grammar, but mostly due to lack of a clear logic linking the statements to the results and figures given in section 4. Many statements are not well explained so they appear unsubstantiated or unrelated to the results of the previous section. Below are some examples of lack of clarity and/or (apparently) unsubstantiated statements.

Response: we are grateful for the concerns you have highlighted on the discussion section. Major revisions on the discussion section have been done to address all the highlighted concerns.