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Interactive comment

Interactive comment on "Analysis of fire dynamics in the Brazilian savannas" *by* Guilherme Augusto Verola Mataveli et al.

Anonymous Referee #1

Received and published: 21 March 2017

Title: Analysis of fire dynamics in the Brazilian Savannas This paper analyses the dynamics of fire occurrence in the Brazilian savannas with the aim to understand the occurrence and the dynamics of fires in the Cerrado using precipitation and vegetation condition as explanatory variables. The Cerrado is a key biome for the country and has been heavily transformed over the years, however in the current state, is hard to extract the added value of this paper to for instance Moreira de Araujo et al paper heavily used in the manuscript.

Abstract. From my point of view it fails to state why the subject is important and what is the problem and how it has exactly or partially address. Fires occur and in the lines 10-12 natural and anthropic causes are mentioned, yet the abstract is not clear about these two and mentions the use of data. Results do not mention LULC and no conclusion is presented.

Introduction. In general terms the introduction can be improved. In the same way that the abstract is written, the introduction clearly lacks a presentation of the nature of the problem and both the scope and the state of art regarding seasonality, climatic changes, land use, ignition sources, etc... In this sense paragraph 1 of the introduction needs to develop what is known of both the relationship between natural causes and fires and also human activities. When and where are one more important than others?. What is know about these in particular in Brazil.? As an example also, page 2 L7 the phrase that starts with Moreover,.. instead of only mention role of climatic variables..., the authors should develop what is known, what kind of climatic relationships have been found, regarding total rainfall, seasonality, drought period rainfall, etc? What about interannual and intraannual variability, much is already known about it. It is important to establish what is known to have a better clarity of why this work is important and adds to the current knowledge. Further, not much is included on the relationship between the vegetation conditions previously or during burning season, needs to be developed. In a similar way, page 2 L13-23 lists studies that have used orbital sensors, but why is it important? What those studies have shown? What are the limitations ? in a way that it could eventually lead to state clearly why there is a need for more consistent information (P2L25) which is not clear. Too much of the methods at the end of the introduction, there is no need to state the data used here, leave this for the methods section. No clear objectives or research questions are presented. Finally, so far is difficult to get the value added of this work to others that have already published dynamics of fire occurrence in the region, like some of the cited references for example (Moreira et al 2012, 2015) and others like see (Pivello, 2011)(Chen et al., 2013)

Methods. Not needed so much information on Modis sensors, can be reduced P3L19 onwards P4 L5 is repeated information In general terms dataset used have different spatial resolution, how the authors have used them? Please clarify in the text. I have a strong concern about the methods used to analyze the relationships and I am afraid at this stage Pearson correlation might not be enough and a time series analysis is

needed to capture the complex climate-vegetation conditions-fire occurrence relation-ships. I would suggest the authors to review some literature in relation to this see for instance (Armenteras-Pascual et al., 2011)(Aragão et al., 2008) etc I found the format changes of the Modis products not necessary and basic information that is totally un-needed as it stands (P5 L29-), same with other sections (P6 L15 tiles) etc. P6 L 5-7 The use of a 4 km grid is not justified. P6 L 12 What is most confident? I found extremely confusing the paragraph P7 L3-9, this is the most important part of the methods, to clarify the type of analysis for each research question.

Results and Discussion Since there is no clear research questions, the results are hard to follow but basically the Moreira de Araujo et al 2015 paper shows the same pattern and is heavily used in the discussion, so again the question is what is the value added of this work? I found the fire density reported really high (can be interpreted as every year all km are burnt..), and is confusing if it is over the 2002-2015, I think a yearly density should be calculated or a map of fire frecuency for the period. The LULC and fire relationship is weakly treated. P7 L 30 first time dry season is mentioned, needs to be explained before in the intro or study are a description P8 Lines3-8, consider abbreviating years, summarizing in a table, using ranges when applicable. P8 L 14-15 any other possible explanation? Human ignition? Management practices? P8 L15-17. Is difficult to get where this point originates or relates to the current study. P8L27 consider introducing these general annual trends before monthly patterns P10L2 land us is well settled, not clear the meaning P11L16-21 what about in tropical? And if soil moisture is so important, was not mentioned in the introduction. Figures. Too many, select the most relevant ones, eg. I would remove Fig Conclusions This section needs to be heavily rewritten, first two paragraphs are not conclusions but mostly repetition of results. P12 L 12 How have you established the conclusion of the cerrado as adapted and dependent of fires? This conclusion is not clear, neither in L19-21

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