

## ***Interactive comment on* “Contrasting patterns of litterfall seasonality and seasonal changes in litter decomposability in a tropical rainforest region” by S. A. Parsons et al.**

### **Anonymous Referee #2**

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### **General comments**

This paper investigates the seasonality of litterfall and litter decomposability in a tropical forest region and aims to explain the link between seasonality and the various biotic and abiotic drivers. The problem of litterfall seasonality in tropical regions is poorly understood and new studies such as this are essential our ability to understand and predict biogeochemical cycles in tropical regions.

The main finding of this paper is that litterfall is less seasonal at more deciduous locations which appears counterintuitive given that deciduousness is a term that refers to seasonal leaf shedding. It would appear from the discussion section that the rea-

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son for this observation is that, at the sites included in this paper, the more deciduous sites have a higher species specific seasonal variability in responses to environmental factors, resulting in leaf shedding events at different times of the year from different species. It is not clear to me if this is a general result that applies to all deciduous tropical forests, not even to all the deciduous tropical forests in Australia. It is however clear that it is not the deciduous character itself that determines the low litterfall seasonality but the particular species composition and this should be stated clearly in the paper.

The Methods section is lacking a full description of the statistical models used. The simple regression model chosen requires a justification for not including site effects and sample pseudoreplication. The data has been processed to obtain seasonality indices prior to analysis and it is unclear if it meets the normal distribution condition of the linear regression models. The inclusion of categorical variables (deciduousness) needs to be justified. Generally, a clear description of the statistical methods and the authors' assumptions is needed.

This paper is also missing a conclusion.

While the main question of this paper (what drives seasonality in tropical forests?) is important and yet unanswered, the data used has been previously published, the statistics are very basic and badly justified and the discussion of the underlying plant physiology and species composition processes is poor, all of which greatly reduce both the quality and the novelty of this study.

### Specific comments

**p7903** , **I6** "C-cycle" replace with carbon cycle

**P7903 I15** "is thus essential in comprehending plant phenology": It can be argued that it is plant phenology which determines the litterfall and not the other way around

**p7903, I24** "deciduous species in seasonally wet tropical forests can shed litter as a response to new growth" Missing reference

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**p7904 I1:** You need to mention what your study region is

**p7905 I11** add temperature units

**p7905 I13:** "summer months" name the months, summer has different definitions in different hemispheres

**p7907 I10:** 'Deciduousness' is not an ecosystem intrinsic property, but rather an emergent property that results out of a combination of factors, such as climate and species distribution.

**p7908 I4** It is unclear if the data on secondary species was obtained and described in a previous Parsons et al paper or if it had another source

**p7909 I6** "in the dry" Missing the word season?

**p7911 I20** "highest annually insolation" Should this be highest annual insolation? Or highest insolation within a year? Does the same period have both high rainfall and high radiation?

**p7911 I22** "in other locations globally": Which locations in particular?

**7914 I14-18** This sentence is badly explained. If trees respond to low moisture stress that is an environmental driver. I fail to see the dichotomy between species traits and environmental drivers in litterfall responses.

**7915 I5** This part of the discussion is based on a regression with an  $r^2$  value of 0.2. Surely there should be a discussion of the other 80% of unexplained variation in the data prior to any other more broad implications.

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Interactive comment on Biogeosciences Discuss., 11, 7901, 2014.

**BGD**

11, C2418–C2420, 2014

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