

# ***Interactive comment on “Application of a new productivity coupling hydrothermal factors (PCH) model for evaluating net primary productivity of grassland in Southern China” by Zheng-Guo Sun et al.***

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Changes in grassland NPP plays important roles in evaluating the environmental quality of terrestrial ecosystems and the variation rule of terrestrial NPP. In this manuscript, to estimate the grassland NPP in Southern China, a new NPP model coupling temperature and precipitation factors was built and validated based on grassland and climate data recorded from 2003 to 2014. The validation result indicates that there was a highly significant correlation between simulated and measured NPP.

As a whole, it is an interesting and helpful research on grassland NPP simulation in

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Southern China, which might be widely used in monitoring and evaluating of grassland vegetation productivity. However, there are some issues have to be clarified. Firstly, could authors more clearly explain how to determine the parameters (i.e.,  $t_1$ ,  $w_1$ ) of the estimation model ( $NPP = T_a \times W_a \times (T + W/6)$ ,  $T_a = \ln(T/t_1 + a_1)$ ,  $W_a = \sqrt{W/w_1 + a_2}$ )? How to determine the values of parameters  $a_1$  and  $a_2$ ? Is there any relationship between the model parameters and the grassland types and their ecological characteristics? How to modify the model to combine with remote sensing data in the future? Secondly, the language of the entire manuscript still needs to be revised by an English native speaker. The manuscript has some issues in text writing that must be addressed before publication in the Journal.

The followings are the details that need to be revised further:

Lines 76-77: “Large quadrats were set in each representative sample plot (10m×10m), and five small squares (1m×1m) were set on corners and in the center of large quadrats.” should be replaced by “Five quadrats (1m×1m) were set on corners and in the center of each representative sample plot (10m×10m)”.

Lines 115-117: “Mean monthly precipitation in the grassland ecological system of Southern China presented a large range throughout a year with min precipitation being 40 mm and max being over 200 mm. ” should be replaced by “minimum precipitation being 400 mm and maximum being over 2000 mm ”

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