

## ***Interactive comment on “Multiyear precipitation reduction strongly decrease carbon uptake over North China” by W. P. Yuan et al.***

### **Anonymous Referee #2**

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This study used three simulation models and satellite imagery to detect variations in plant production in northern China from 1999 to 2011. The paper is not acceptable for publication in any scientific journal, due to incorrect assumptions about the application methods for these plant production models and unsubstantiated conclusions about the model results. I recommend that the paper be withdrawn from BGD as soon as possible.

The most serious problems with the study are as follows:

The modeling methods reviewed in section 2.2 do not provide nearly enough detail to evaluate whether the models used in this study were calibrated correctly and applied in the proper manner, particularly using satellite data inputs. For instance, the CASA model requires recalibration to MODIS or AVHRR greenness data by optimization of

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the maximum light use efficiency parameter. There is no description of which satellite greenness index was used in this model application, nor how the NPP algorithm was calibrated with a valid maximum light use efficiency parameter.

Furthermore, CASA is not and never has been used as a GPP simulation model. It is completely unjustified (i.e., with no empirical evidence) to simply double NPP to estimate GPP from a simple model like CASA. All the results from the CASA model reported in this paper are therefore invalid for this reason alone and should never have been included in the comparison results.

MODIS GPP and NPP algorithms have been judged to be inherently unreliable due to limitations described by Medlyn (2011) and Samanta et al. (2011), which include generally weak correlations with field observations and extreme sensitivity to air temperatures that can unrealistically increase autotrophic respiration costs and artificially drive down these NPP predictions during drought periods. Therefore, the odds of presenting misleading results from the MODIS GPP and NPP results for northern China are high.

Medlyn BE (2011) Comment on “Drought-Induced reduction in Global Terrestrial Net Primary Production from 2000 Through 2009”. *Science* 333:1093.

Samanta A, Costa MH, Nunes EL, Vieira SA, Xu L, Myneni RB (2011) Comment on “Drought-Induced reduction in Global Terrestrial Net Primary Production from 2000 Through 2009”. *Science*, 333:1093.

Other weaknesses of the paper:

Section 1. The second paragraph of the introduction is not relevant to this study. The topic of this paper is carbon uptake over northern China, nowhere else.

Section 2.1 No peer-reviewed publication references are provided for either the land cover fractions nor the climate input data sets used in the carbon modeling.

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