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Interactive comment on "Impacts of climate and reclamation on temporal variations in CH_4 emissions from different wetlands in China: from 1950 to 2010" *by* T. Li et al.

Anonymous Referee #1

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Comments to "Impacts of climate and reclamation on temporal variations in CH4 emissions from different wetlands in China: From 1950 to 2010" prepared by T. Li et al.

This paper conducted a comprehensive CH4 greenhouse gas emission study aiming to 1) quantify regional CH4 emissions from natural wetlands at a national scale, 2) explore temporal dynamics of regional CH4 budget, and 3) examine the potential impacts of climate and anthropogenic activities on CH4 dynamics. This topic is suitable to the Special Issue "Hotspots of greenhouse emissions from terrestrial ecosystems on global and regional scales". Overall, the paper is well written with a good structure and it presents a timely modeling study to quantify CH4 budget of natural wetlands at a national scale. I would like to recommend it for publication in Biogeosciences if the

authors are able to make some revisions based on my comments as below.

1) Section 2.1: It may be better to move the brief description of CH4MOD_wetland in Supplement to section 2.1. In addition, I think a more detailed description of the model, including basic model assumptions and structures, is needed. It seems to me that current description of the model only covers model inputs, outputs, etc. 2) Section 2.2: The author should justify why only two parameters are calibrated. Are these two most important in the model? What about other parameters? 3) Section 3: I think "temporal variations" also include seasonal dynamics. I would suggest the authors add some results on seasonal dynamics (or intra-annual variations) of CH4 emissions in this section. This should be a part of a "comprehensive" study of CH4 dynamics. 4) Section 4: Some additional discussion is needed to present current knowledge gap in modeling CH4 processes and large-scale CH4 emission quantification. How is your CH4 model different from other CH4 models? Such as those used in recent CH4 model inter-comparison studies (e.g., Bohn et al. 2015, Melton et al. 2013). What are present research state and largest challenges in large-scale CH4 emission simulations? In addition, it is also helpful to compare temporal dynamics of CH4 (inter-annual, intra-annual, trends) in your simulations with other studies.

Others: 1) P7057 L2: you may update radiative efficiency of CH4 from IPCC 2013. 2) P7057 L11: delete "e.g.," 3) P7057 L13: change "sinks" to "sources"? 4) P7059 L5: delete "and" 5) P7060 L8: what does "vegetation index" mean? 6) P7062 L6: change "assigned to" to "assigned based on". 7) Figure 4: add (a),(b), ... (e); delete "at a significantly"

Bohn, T., J. Melton, A. Ito, T. Kleinen, R. Spahni, B. Stocker, B. Zhang, X. Zhu, R. Schroeder, M. Glagolev, S. Maksyutov, V. Brovkin, G. Chen, S. Denisov, A. Eliseev, A. Gallego-Sala, K. McDonald, M. Rawlins, W. Riley, Z. Subin, H. Tian, Q. Zhuang and J. Kaplan (2015). WETCHIMP-WSL: intercomparison of wetland methane emissions models over West Siberia. Biogeosciences, 12, 3321-3349, doi: 10.5194/bg-12-3321-2015. Melton, J. R., et al. "Present state of global wetland extent and wetland methane

modelling: conclusions from a model intercomparison project (WETCHIMP)." Biogeosciences 10 (2013): 753-788.

Interactive comment on Biogeosciences Discuss., 12, 7055, 2015.