

Interactive comment on “Simulating damage for wind storms in the land surface model ORCHIDEE-CAN (revision 4262)” by Yi-Ying Chen et al.

Anonymous Referee #1

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Simulating damage for wind storms in the land surface model ORCHIDEE-CAN (revision 4262) Yi-Ying Chen¹, Barry Gardiner, Ferenc Pasztor, Kristina Blennow, James Ryder, Aude Valade, Kim Naudts, Juliane Otto, Matthew J. McGrath, Carole Planque, and Sebastiaan Luyssaert

General Comment The authors incorporate a well-established wind disturbance model (ForestGALES) into a dynamic global vegetation model, the ORCHIDEE-CAN. It is perhaps the first study of windthrows simulation by an Earth System Model (ESM). I emphasize the novelty of this study because it improves our understanding of an overlooked agent of tree mortality (wind) in forest ecosystems.

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Comments/Concerns: 1. Winds are a major agent of tree mortality, a well-known fact that has been discussed extensively in the literature over a range of spatial scales and ecosystems. Yet, the introduction of this study is very limited and does not justify why windthrows need their own representation scheme in an ESM. Furthermore, there is not a formal definition of wind storms. Wind storms can vary from strong winds to tropical cyclones. The frequency and the spatial scales of these events justify this study. However the reader is left to wonder whether this type of study is important. 2. The use of a sigmoid function to represent the storm damage (Equation 9) was not justified. 3. The calculation of critical wind speed uses five tree species. How representative are these species of the whole simulation domain? Are these tree from the same Genus or Family? 4. The comparison of modeled damage versus the observational data would benefit from the inclusion of percentage. 5. Critical wind speed and downscaling require more detail. What is the wind speed needed to overturn trees in the study area? How does it compares with the critical wind speed? 6. An analysis of forest damage focusing on pixel heterogeneity vs wind speed is relevant for this study.

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