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Surface temperature change in response to the wind throw

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Earth System Models are currently the most advanced tools to study the interactions between humans, their use of natural resources and the climate. In a previous study we have successfully implemented a process-based stand-scale wind-risk model, ForestGALES, into a large-scale land surface model, ORCHIDEE-CAN (Chen et al, 2017). Including the ForestGALES functionality into ORCHIDEE-CAN required numerically efficient solutions for downscaling wind speeds, estimating wood damage and dealing with subpixel surface heterogeneity. The new model implementation has been evaluated for five of the dominant tree species in Europe, including spruce, pine, beech, birch and oak. In this study this recently developed model was used to simulate changes in land surface temperature following large scale wind disturbance. The contribution of different terms in the surface temperature change such as albedo, turbulence fluxes and ground heat flux were examined and evaluated against observational data from the FLUXNET network.

Reference:
Chen, Y.-Y., Gardiner, B., Pasztor, F., Blennow, K., Ryder, J., Valade, A., Naudts, K., Otto, J., McGrath, M. J., Planque, C., and Luyssaert, S.: Simulating damage for wind storms in the land surface model ORCHIDEE-CAN (revision 4262), Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2017-174, in review, 2017.