Clim. Past Discuss., 11, C764–C766, 2015
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Climate of the Past Discussions

Interactive comment on "Variability of daily winter wind speed distribution over Northern Europe during the past millennium in regional and global climate simulations" *by* S. E. Bierstedt et al.

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Received and published: 22 June 2015

We thank the reviewer for his carefully reading of the manuscript and providing very constructive criticism. Below is an overview of how we would revise the manuscript. Note that we discuss only the major drawbacks. All minor comments will be addressed as well in the way suggested by the reviewer.

Main Point 1: "I find the description of the simulations not precise enough. External forcing are key elements of simulations, and as its stands the manuscript does not offer any clear way to estimate the forcing present in the simulation. [...] Moreover, even the land-use change is very rapidly depicted in Fig. 7 with comparison of only

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two periods from a millennium simulation. This is not enough to prove anything: time series are necessary as well."

We understand the criticism regarding the brief modeling description. We did so because these simulations are already analysed and described in great detail in their respective publication, and therefore we decided to be brief in the description, referring the reader to the original references. However, taking into account the reviewer's suggestion we will extent this part and will describe the prescribed forcings in greater detail, including the changes in land-use. Still, note that the illustration of the land-use changes as a single time series is difficult, because land-cover is characterized by several types of land-use (forest, pasture, bare soil, etc): In our case, it is the forest fraction that seems to be the most significant for wind, and we will include a time series of the forest fraction. However, the inference of the influence of the forest fraction is more given by the spatial pattern of change, and not only the evolution in time. In addition, we will consider to include a comparison of wind distribution changes and the tree fraction time series for the ECHAM5 and ECHAM6 simulations.

Main Point 2: "...figures are not provided for same time period,... ...we need to know more clearly and quantitatively what are the variations of the forcings over this time period."

As suggested by the reviewer, we will include in the revised manuscript, additionally, the results of the correlation analysis obtained in the same periods (with the exception of the reanalysis data sets which are much shorter, and which were included in the analysis as an approximate ground truth). Note that we already had a brief look into the correlation values of the GCMs and RCMs shown in Table 2 and compared them with the values for the overlapping time period (1655-1990). The main conclusions of Table 2 stay the same; some correlations become higher (mTemp), whereas some stay at the same level (NAO, tGrad - beside ECHAM6 which shows now values around zero) and some are now lower (mTemp-tGrad). The new version will also include a comparison between the correlation maps obtained over the whole period and over the

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overlapping period in order to assess the robustness of the conclusions.

Interactive comment on Clim. Past Discuss., 11, 1479, 2015.