The authors would like to thank the anonymous reviewer for his/her comments. Herewith our answers to the six specific comments:

A) A sentence (underlined) will be added at the end of Section 2.3 in the final version of the manuscript to justify why we restrict the analysis to three simulations: "The three simulations used were the only RCM simulations available for our pilot study. The authors are aware that a CC impact assessment study cannot be made with only three simulations coming from only one RCM. The aim of this work is to evaluate a methodology; the results of this work must not be taken as a complete CC impact assessment study."

B) A paragraph will be added just before Section 3.1 to justify why we restrict the analysis to only spatial disaggregation and do not consider time: "Since observed and simulated data are both available on a daily time step, temporal disaggregation of precipitation was not considered. The authors are aware that for some hydrological applications on small watersheds, a finer time step (e.g. hourly) would be required. The actual version of the disaggregation model described herein does not perform temporal disaggregation."

C) A sentence will be modified (currently on P.8171, Lines 3-5) and two others will be added (underlined) to better illustrate the advantages of the model used in this work compared with other disaggregation models reported in the literature: "Gagnon (2012) recently proposed a stochastic disaggregation model accounting for convective available potential energy (CAPE), wind speed and wind direction. To our knowledge, there is no other spatial disaggregation model using a stochastic algorithm and the physical properties CAPE, wind speed and wind direction as covariates. This approach provides a way to produce spatially coherent fields, which is the main challenge for spatial disaggregation models." Another sentence will be added just above (see specific comment *F)*).

D) Danemark" will be replaced by "Denmark".

E) The sentences currently on Page 8182 Lines 4-10 will be modified to clarify the idea: “The estimation of the CRCM simulation bias, which is the purpose of the validation exercise, cannot be made with precision since the bias of the disaggregation model and the difference in resolution between the 4-km pixel and the observations are not known with exactitude. That being said, it is possible to get rough estimations of the impacts of both disaggregation model bias and the difference in resolution between the 4-km pixel and the observations. The results in Gagnon (2012) suggest that 4-km precipitation depths generated from the disaggregation model are more likely underestimated than overestimated for the most intense events. Also, Fig. 3 suggests that precipitation depths increase as the pixel size decreases, implying that the impact of the difference in

resolution between the 4-km pixel and the observations should be negative as well. It implies that the value of $\left(Y_{4\mathrm{km}}^{*} - X\right)$ should be a lower bound for the positive bias of the CRCM simulation."

F) A sentence will be added (underlined) in the Introduction (currently in P.8170 Line 28 - P.8171 Line 3) to better contextualize the reference to Lovejoy and Schertzer (2010): "This kind of models is often referred to as disaggregation models (e.g. Mackay et al., 2001). Disaggregation models may be applied after dynamical downscaling. The most popular technique used by the existing disaggregation models is the multiplicative cascade (see e.g. Over and Gupta, 1996; Harris and Foufoula-Georgiou, 2001; and Sharma et al., 2007). The advantages of this technique are its relative rapidity and simplicity of use, but it often produces precipitation fields with unrealistic spatial structures, with visible discontinuities (Lovejoy and Schertzer, 2010)."

Additional references:

Harris, D. and Foufoula-Georgiou, E.: Subgrid variability and stochastic downscaling of modeled clouds: Effects on radiative transfer computations for rainfall retrieval. *Journal of Geophysical Research*, 106, 10,349-10,362, 2001.

Over, T.M. and Gupta, V.K.: A space-time theory of mesoscale rainfall using random cascades. *Journal of Geophysical Research*, 101, 26,319-26,331, 1996.

Sharma, D., Gupta, A.D., and Babel, M.S.: Spatial disaggregation of bias-corrected GCM precipitation for improved hydrologic simulation: Ping River Basin, Thailand. *Hydrology and Earth System Sciences*, 11, 1373-1390, 2007.