

Interactive comment on “Relative impacts of land use and climate change on summer precipitation in the Netherlands” by E. Daniels et al.

Anonymous Referee #2

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This paper is a nice study which looks at the effects of historic and future land use on precipitation in the Netherlands. The authors do this by looking at a number of summer days with similar meteorological conditions and using WRF to examine the effect of changing land use from historic, present day and future conditions and compare this to a temperature perturbation to see which has most effect. They find that the effects of land use are not negligible although the temperature rise has a larger effect on precipitation intensity. I suggest that the paper is accepted with recourse to moderate revisions.

Suggested revisions 1. Add some detail into the abstract on what decreases in precipitation are simulated following conversion of historic to present and present to future land use. 2. It is unclear how many summer days you are examining – is it 19 or 18? Check your paper as this is not clear (both are used) 3. P5, lines 3-9: please make it

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more clear how long the simulations are. This does not jump out at me from the text and I had to do some searching to find this information in the paper. Are the models just run for the 19 selected cases? 19 days for each land use scenario? If this is the case, is one model run of each day enough with which to draw strong conclusions? What role might initial conditions uncertainty play? 4. Why should you be able to add linearly the response of precipitation to land use change and climate change? This does not make intuitive sense. 5. The model inadequacy in representing current climate precipitation needs be discussed much earlier than in the discussion section – what implication does this have for the results of the study? It would be nice to see more detail in the discussion on the Trusilova et al. studies to see if the results are directly comparable. 6. It would be nice to see some discussion of natural variability and the effect of varying initial conditions on the results. 7. P10, line 10-20: Why does land use change have such a disproportionate effect in summer? 8. P10, line 28-29: The mean change simulated in this experiment is not comparable to mean change simulated by GCMs as you only simulate a few days – make this clear. In general are GCM results really comparable given that convective-permitting model experiments suggest that they do not adequately simulate summer precipitation intensities. 9. P11, line 10 onwards: could this also not be a sampling effect? Is the statement “no increase in extreme precipitation is found in the combined future land use-climate simulation” correct as this seems to contradict what you have said earlier in the paper. 10. Figure 8: Looking at the diurnal cycle of precipitation the huge difference between observed and model simulated worries me – do models give us realistic enough results to use to show sensitivity to land use change. The changes predicted by the model are much smaller than the bias between the model and observations.

Minor typos 1. P4, line 8: processes; line 23: most like 2. P5, line 14: declining rate 3. P6, line 14: in the evening is found in only two simulated days. . . ; line 26: decrease 4. P8, line 16: opposite; 5. P9, line 23: useful