

Interactive comment on “Investigating the impact of land-use land-cover change on Indian summer monsoon daily rainfall and temperature during 1951–2005 using a regional climate model” by S. Halder et al.

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General comments

The authors study realistic land-use and land-cover changes from 1951–2005 over India in a regional climate model and show that moderate rainfall events are impacted significantly by these changes. Moreover, they have repeated the simulations without the observed ocean warming trend to confirm the effects of the land surface on the Indian climate.

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In my opinion, this is an important subject to study as India is a part of the world where land-use has changed significantly and the effects of changes in rainfall distribution are important, for example for agriculture.

I think the study is well executed and the conclusions drawn are supported by the experiments. My main concern is the fact that only one model is used. As regional climate models respond different to these kinds of land surface changes, this uncertainty should be discussed more thorough. Moreover, some textual improvements should be made.

Specific comments

- P6593,I20: Here, you state that RCMs have trouble to capture the observed frequency distribution of rainfall. I think this is true. However, in the discussion (section 5), it is only briefly mentioned. I think that is a place to convince the reader that the results found are due to the changes in the model and not due to other factors (parameterisation schemes, resolution differences, boundary forcing, etc.).
- In many places, the text is vague or gramatically incorrect. Please have a look at it. (See textual comments below for some examples.)

Minor and textual comments:

- Use of brackets to state the opposite is confusing to me, maybe separate sentences can be made. One example, but many occurrences in the text: ‘... region of decreased (increased) forest (crop) ...’ (P6578, I10).
- P6578,I15: argues → argue.
- P6580,I20: the effects → the climate effects

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- P6580,I26: fix accent in Ducroudre
- P6584,I13: I visited the website, but found that the data are only available for purchase. This makes it hard to repeat the detection of precipitation changes. Would it not be better to use the APHRODITE dataset, which is publicly available?
- P6586,I21: remove degree signs.
- Paragraph 2.3: How is the orography treated? This is a very important aspect, so maybe include it here.
- P6588,I4-5: "Extreme rainfall ... return periods.", this is a strange sentence, seems to be a truism, maybe it can be changed into something more informative.
- P6589,I21: till → to.
- Section 3.2: Some of this section could go to the introduction.
- P6590,I7-8: "On the contrary ...", this is a strange sentence.
- P6590, I26: "Daily maximum... day.", Remove this sentence or replace with something more informative.
- P6591, I7: Can the statement about the coincidence of decreasing trend in daily temperature and forest cover be substantiated with a spatial correlation?
- P6592,I25: This rain-shadow area relates strongly to the orography in the model, so please include details on the orography.
- P6593,I9: "On closer examination...", this wording could be a bit more formal.
- P6599,I9: warmer → higher.

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- P6599,I10: "relatively less than the observed increased", this is an unclear statement, please be more specific.
- P6604,I4: Difference → The difference.
- P6621,caption: switch crop and forest to have them in the same order as the figures are.
- P6624,fig 4: Could the shading be made with the same scale, that would be clearer. Moreover, the APHRODITE and IMD data do not seem to differ very much, so why not use only APHRODITE as that one is freely available.
- P6599,I24: 925 the hPa level → the 925 hPa level (or at 925 hPa?).
- In some places in the text, words are capitalized that should not be, some examples:
 - P6601,I22: Bowen Ratio.
 - P6601,I24: Tropics (not sure whether this should be capitalized)

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