

General comments

In their contribution, Berg et al. advance cascade bias-adjusting by introducing a practical method for implementing this on both spatial and temporal scales. In my opinion, the importance of this paper is twofold. First, it reinvigorates the cascade bias-adjusting principle, which has, since the papers by Haerter et al. (2010) and Haerter et al. (2011) not received much attention. Second, it does so by introducing applicable code. This allows for discussing some technical details, such as the spline-based fit, which are often overlooked in papers merely introducing new methods. However, when methods are effectively applied, this attention to detail is necessary.

However, I think the focus of the paper is still slightly too narrow and some additional discussions could help other researchers to build on the proposed method. In general, I think two additions could greatly enhance the paper.

First, although Haerter et al. (2010) (and the follow-up paper Haerter et al. (2011), which is strangely enough not mentioned) are the seminal papers regarding cascade bias-adjusting, similar ideas (multiple timescales) are discussed in other papers, such as Johnson and Sharma (2012), Mehrotra and Sharma (2015) and Nguyen et al. (2016). I think it would be fair to acknowledge this and discuss some similarities and differences. In addition, Mehrotra and Sharma (2015) propose a multivariate method for multiple timescales. It would be interesting to have a short discussion on the possibility to allow for multivariate adjustment with MIdAS, as this is a relevant subject nowadays

Second, some limitations are given throughout the text. Some are picked up in the discussion, such as the bounded nature of precipitation, whereas others, such the difficulties with parametric methods, are left out. To further the application and to assess the relevance of MIdAS, it seems relevant to me to have a larger discussion on these limitations.

In addition to these comments, I would like to note that due to time constraints, I could not look at the code and other assets.

Specific comments

L. 47: For multivariate adjustment, I think you should also refer to François et al. (2020), as this is one of the few papers so far that provide an overview.

L. 103-125: As far as I know, a spline-based method is not applied anywhere else. While this is implicitly mentioned in the text, it would be good to make this explicit if this is the case. Although this might seem a detail to some, it is indeed a practical and relevant technical improvement for easy bias adjustment.

L. 136: Why are spatial cascades not implemented in MIdAS? Are there any plans to do so in the near of far future?

L. 153: As mentioned in the general comments, it would be interesting to have a more extensive discussion on the benefits and drawbacks of parametric methods and their inclusion in (generally) cascade frameworks and (specifically) MIdAS.

L. 196-198: multiple papers discuss the issues on climate change signal modification. Although an extensive discussion is unnecessary here, it would be great to point the interested reader to some references, such as Maraun (2016), Ivanov et al. (2018) or Casanueva et al. (2018).

L. 203-204: The link between model independence, genealogy and pseudo-reality experiments might not be clear for every reader, given the rather short discussion. It could be relevant to slightly enlarge this.

L. 217-219: These sentences are somewhat confusing, as 'performs slightly worse' contrasts with 'perform worse'. A rephrasing probably allows for more clarity.

L. 221: 'some outlier bias' seems to be contradicted by the large scores for QDM in Figure 5.

L. 226: It could be relevant for some readers to refer to papers discussing the uncertainty in the process chain, such as Bürger et al. (2013), Hingray and Saïd (2014) or Lafaysse et al. (2014). My knowledge on this topic is far from complete, so other papers might be relevant as well.

L. 278: 'The impact is stronger on other statistics that are not explicitly accounted for.' It is explicitly suggested by Maraun and Widmann (2018) to use statistics that are not accounted for in the evaluation of bias-adjusting methods, which you could refer to.

L. 284 and further: as already mentioned, I miss some information on what could be done to further improve the application of MIDAS, although this could further enhance the relevance of the paper.

L. 290-296: Linked with my comment on L. 136: are there any plans to implement spatial cascaded in the publicly available version of MIDAS? If not in the near future, why?

Technical comments

L. 136: 'experiments ... has' should be 'experiments have'

L. 147: 'ny physical meaning' should be 'no physical meaning'

L. 174: This line misses a space after '(Maraun, 2012).'

L. 201: 'apart' instead of 'appart'

Tables 3 and 4: 'Variable' instead of 'variabel'

Table 4: a bold font is mentioned in the caption, but not applied anywhere in the table.

References

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