Geoscientific Model Development Discussions

Geosci. Model Dev. Discuss., author comment AC3
https://doi.org/10.5194/gmd-2021-21-AC3, 2021

Final Author Comment on gmd-2021-21

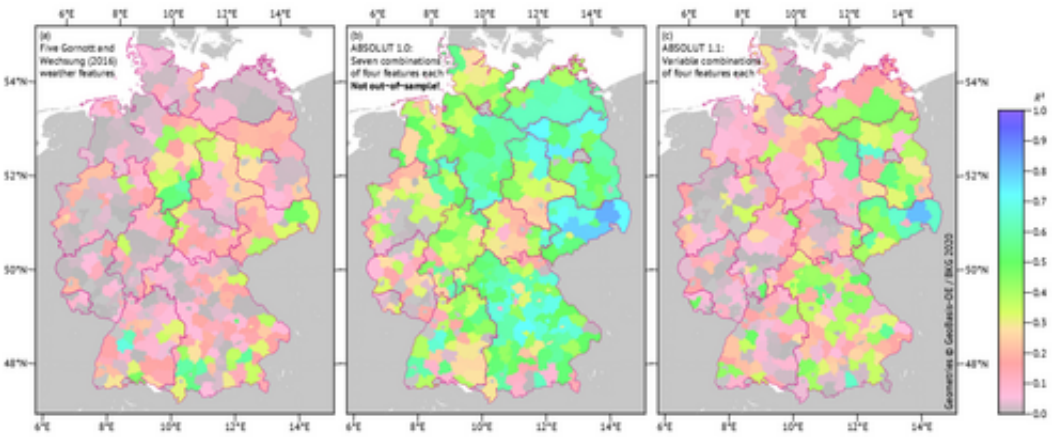
Tobias Conradt

Author comment on "Choosing multiple linear regressions for weather-based crop yield prediction with ABSOLUT v1.1 – Initial tests for the districts of Germany and an over-confidence trap in statistical modelling" by Tobias Conradt, Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2021-21-AC3, 2021

A first remarkable output of the overhauled ABSOLUT 1.1 version

The big difference to the 1.0 version on which the preprint under discussion was based is the selection of input features (weather aggregates) in an out-of-sample manner. In the former 1.0 version individual input feature combinations were selected and fixed for each district only once – based on all available yield data –, and only the coefficient and yield estimates were based on censored data not including the yields of the actual year to predict (out-of-sample). The overhauled 1.1. version determines also the variable combinations for the district regressions separately for each target year, using only observations from the remaining years.

Performance losses had to be expected, but they are quite dramatical. The triple-map graphic…



[full-resolution PDF attached]

…is an extension of Figure 8 in the preprint visualizing shares of winter wheat yield variances explained out-of-sample on district level. The left and middle panel repeat the original figure, these are the performance maps for the Gornott and Wechsung and the ABSOLUT 1.0 approch, the latter being only quasi out-of-sample. The right panel shows what remains for the true out-of-sample estimations of ABSOLUT 1.1 – at least still a little

better than the Gornott and Wechsung performance.

I think this is highly instructive, and I will still show and discuss the bogus performance of ABSOLUT 1.0 in the revised manuscript: The choice of explaining variables is as relevant for the observed model performance as is the actual information content of the available regressors. It is possible that many weather-based yield prediction approaches are in fact less accurate than reported in the literature because the available training data are rarely censored already in the model development phase. This could also explain the obvious performance losses of the Gornott and Wechsung approach compared to the results presented in their 2016 paper.

As this point is so central – thanks again to referee no. 1 for breaking the window – I suggest the altered title: "Choosing multiple linear regressions for weather-based crop yield prediction with ABSOLUT v1.1 – Initial tests for the districts of Germany and an over-confidence trap in statistical modelling." Completing the extensive revision of the manuscript will take some extra time, but I hope it can still be finally published in GMD.

Please also note the supplement to this comment:
https://gmd.copernicus.org/preprints/gmd-2021-21/gmd-2021-21-AC3-supplement.pdf