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Hydrology and Earth System Sciences Discussions

Interactive comment on "Dynamically vs. empirically downscaled medium-range precipitation forecasts" *by* G. Bürger

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General remarks (common to all referee comments)

All three referees expressed some concerns over the validity of the downscaling comparison. How can I compare to downscaling schemes that are driven by different models? - I can only agree, and I would have preferred that kind of comparison if the information were available. For the period 2002 to 2005 (verification) the LM data were, luckily, archived by the LUBW. The DWD, so I was told, does not archive any numerical predictions beyond 12 months, hence no GME data are available for that period. But I will double check with Damrath/Majewski from DWD.

ref. #1

I agree that the overall prediction skill is low, but I also haven't found any comparable published study that would do better than IFS/EDS. With regard to the contingency table results I will check for persistence, but I don't know what is meant by 'climatology'. Usually, the reference forecast for the GSS is 'random', meaning that you pick events randomly according to their observed frequency. But that would be climatology, no?

The C/L assessment used a rather simplistic approach. Perhaps a value of C/L = 1/100 is more realistic, but does a typical Q_99 event really cause so much damage? Note that the expected costs e depend linearly on C/L (cf. Eq. (6)), causing a scaling of e in the C/L Figures.

ref. #2

As mentioned, I will contact Damrath/Majewski for a comparison. There is one publication (Ebert et al., BAMS 2003) which shows the DWD model (I think in an older version) slightly outperforming the ECMWF for precipitation over Germany for the year 2000.

The COSMO-SREPS studies in fact show a dependence on the parent model, but not a unique one. Most importantly, however, they do not show any comparable drop in skill as I've reported here.

Overprediction is mentioned in the paper, and as you say, it is not bad per se. That's why I used the C/L analysis in the first place.

ref. #3

There are indeed numerous downscaling comparisons in the literature. But their focus is always on 'climate downscaling' with the ultimate target of producing regional climate scenarios (mostly on the monthly timescale as in your examples). My focus was on (verifiable) weather prediction and on the daily timescale.

The predictor fields are 'interpolated' as part of the ECMWF download process of spec-

tral fields. I chose, uniquely for the entire model period, the maximum resolution available in that period. The subsequent EOF reduction filters the data according to their predictive performance in the region.

The significance of the results is partly taken care of by using the GSS, which relates to the skill of random forecasts. Moreover, the various lead times and thresholds are (fairly) statistically independent so that similar results based on pure chance are extremely unlikely.

I wanted to show expected daily costs depending on lead time, so introducing another dependency on the C/L ratio would require a 2-dim figure. I guess it suffices to mention one more C/L ratio, such as 1/100 (but see my last comment to ref #2).

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 3517, 2009.