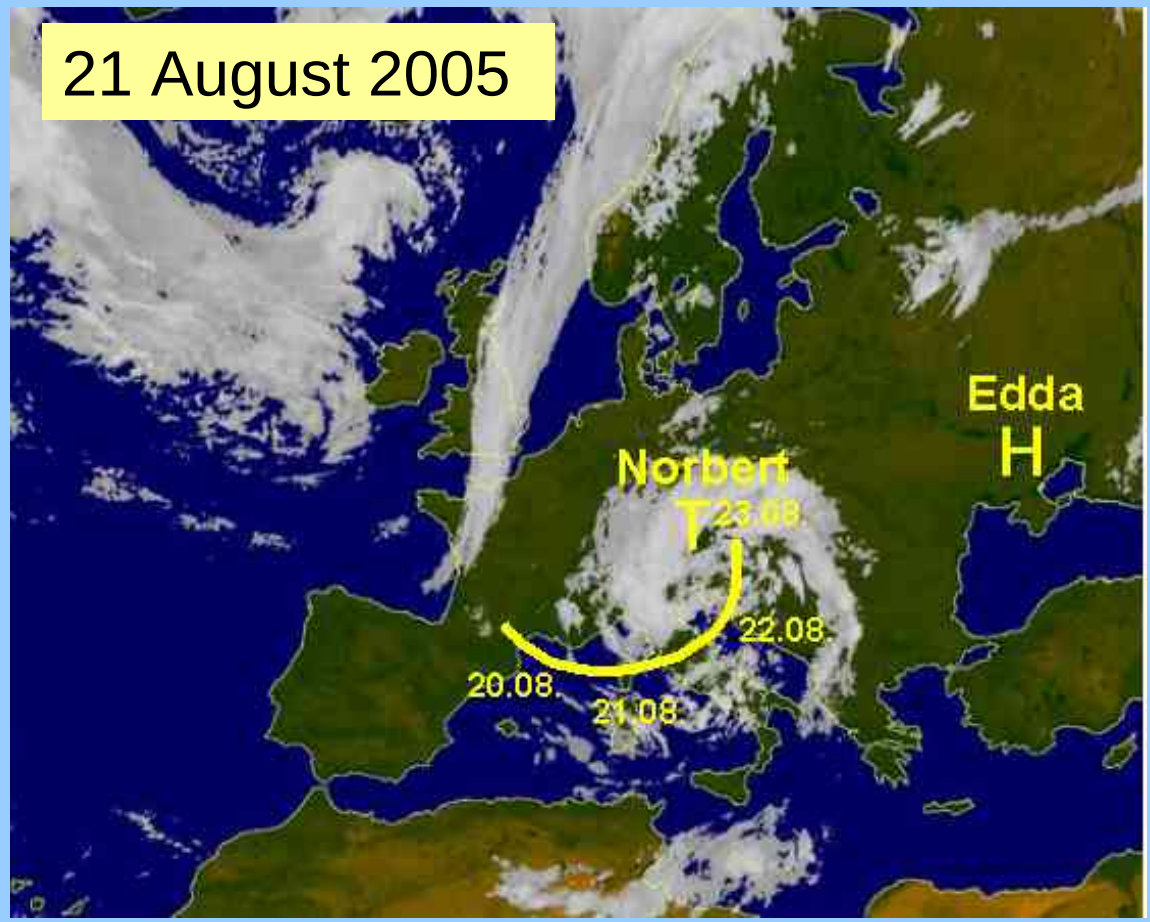
The intensity scale verification method with missing value



Data description

Observation: 450 pluviometers → gridding in connection with a fine scale climatology

Model : COSMO Swiss implementation

Resolution: 7km

Valid: 06-30 h FCST

Two-dimensional discrete Haar wavelet filter (Barbara Casati et al, 2004)

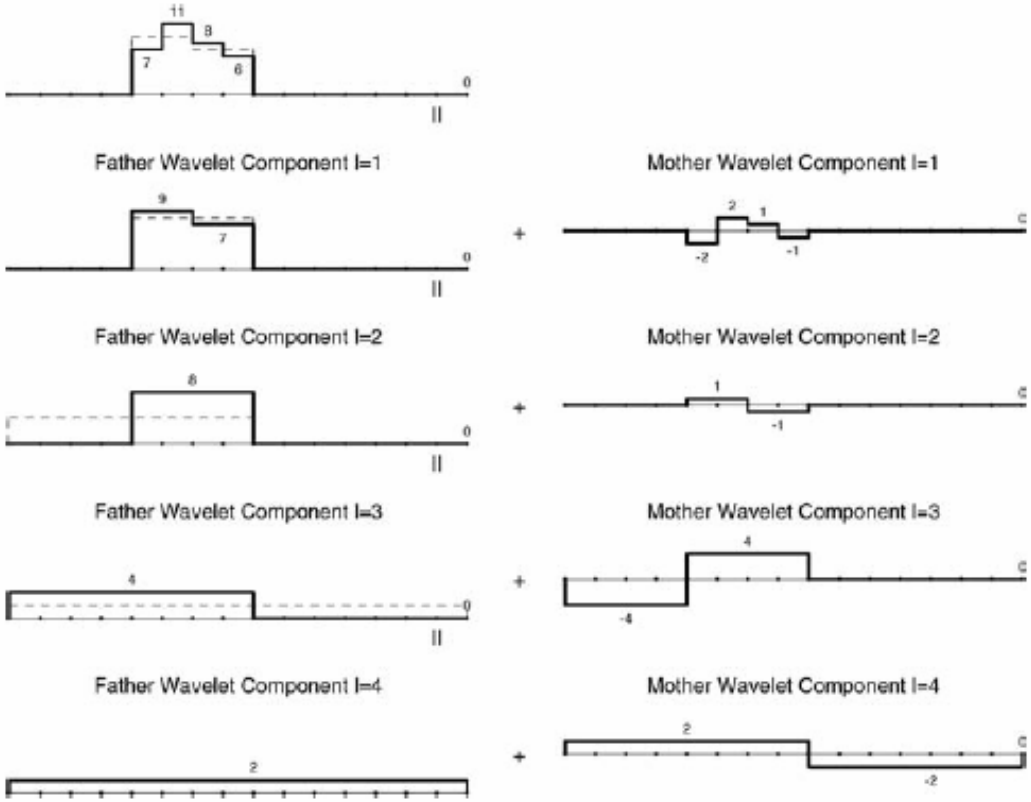
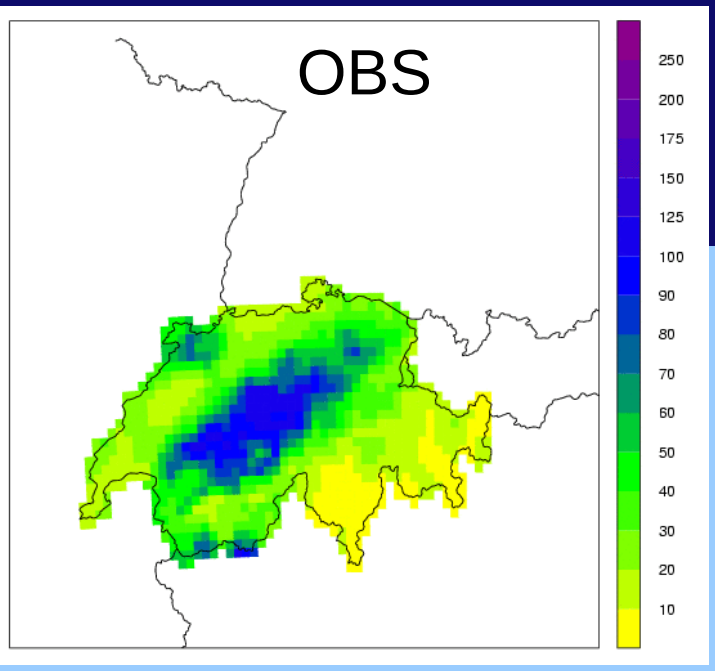
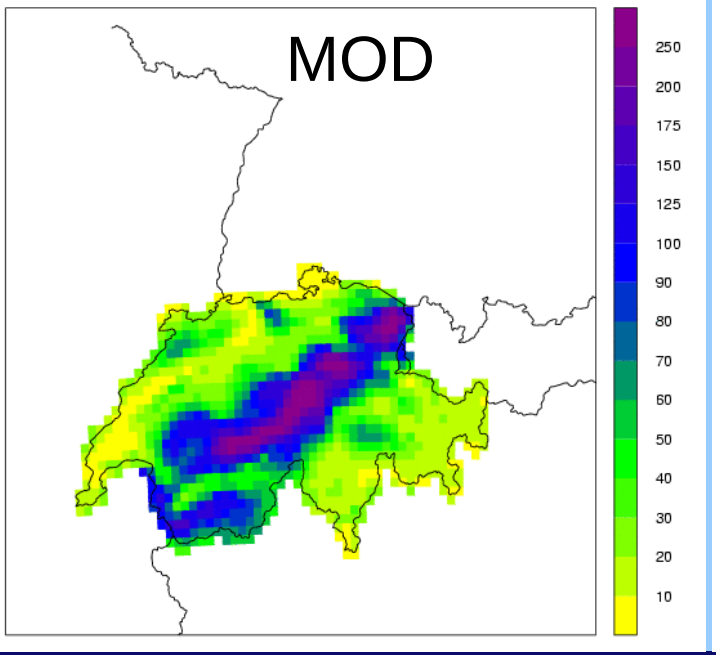


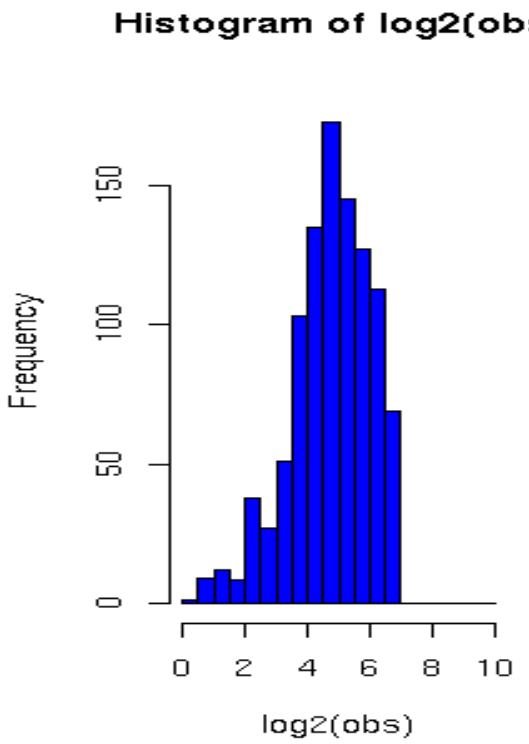
Figure 11. *Example of the one-dimensional discrete Haar wavelet filter applied to an example function (top left panel). At the first step the function is decomposed into the sum of a coarser* mean *function (the first father wavelet component) and a* variation-about-the-mean *function (the first mother wavelet component). At each step the Haar wavelet filter decomposes the father wavelet component obtained from the previous step into the sum of a coarser* mean *function (the l^{th} father wavelet component) and a* variation-about-the-mean *function (the l^{th} mother wavelet component). The l^{th} father wavelet component is obtained from the initial function by a spatial averaging over 2^l pixels. The process stops when the largest father wavelet component (mean over the whole domain) is found.*

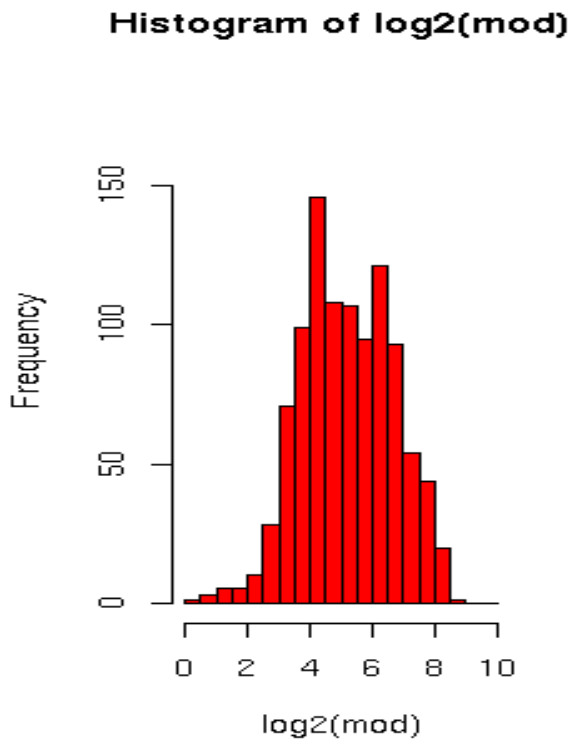




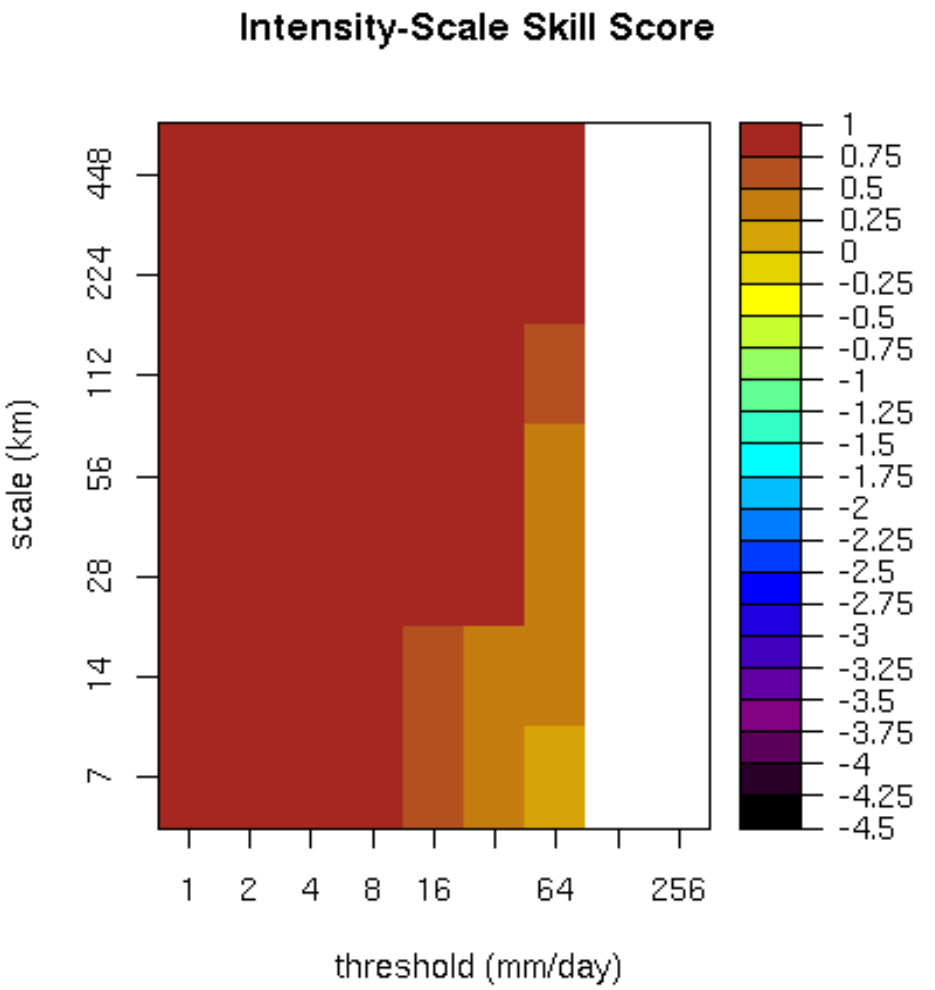
Method

- Extending the grid to 64X64
- All gridpoints outside Switzerland are set to 0 mm



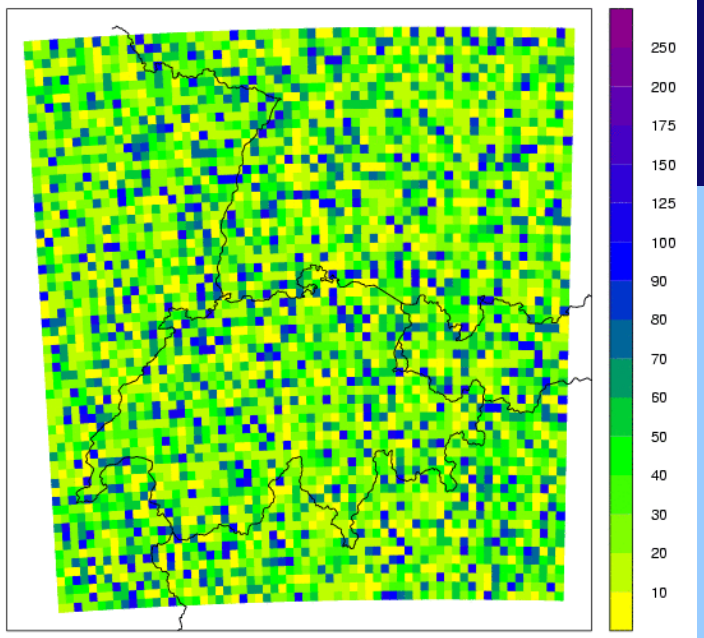


Intensity Scale Skill Scores are all positive

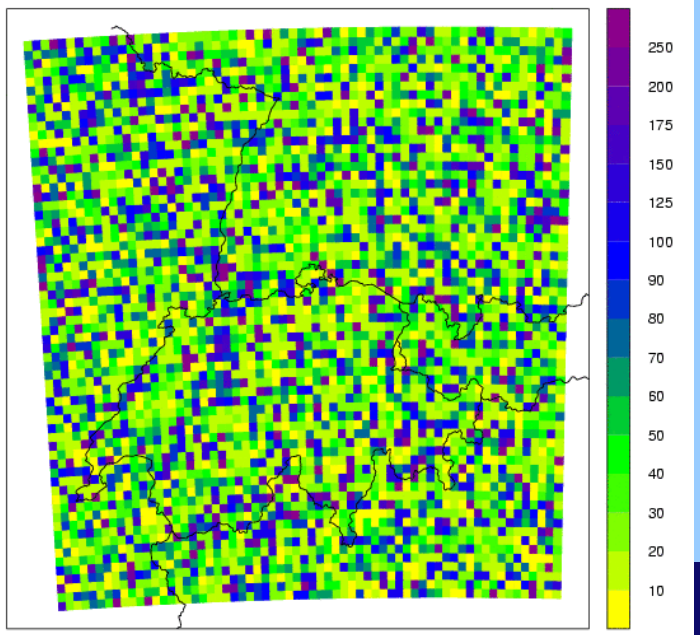


How much do the outside gridpoints contribute?

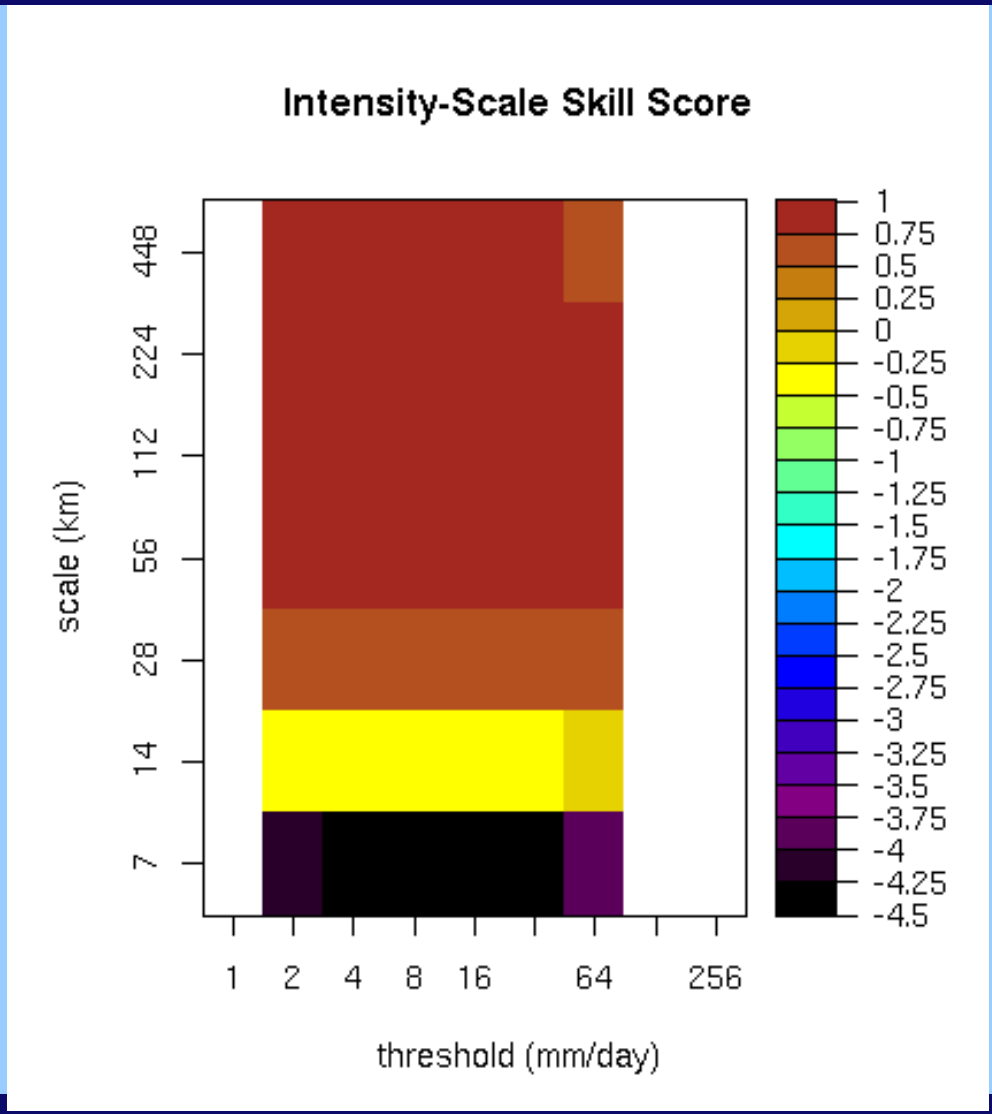
OBS



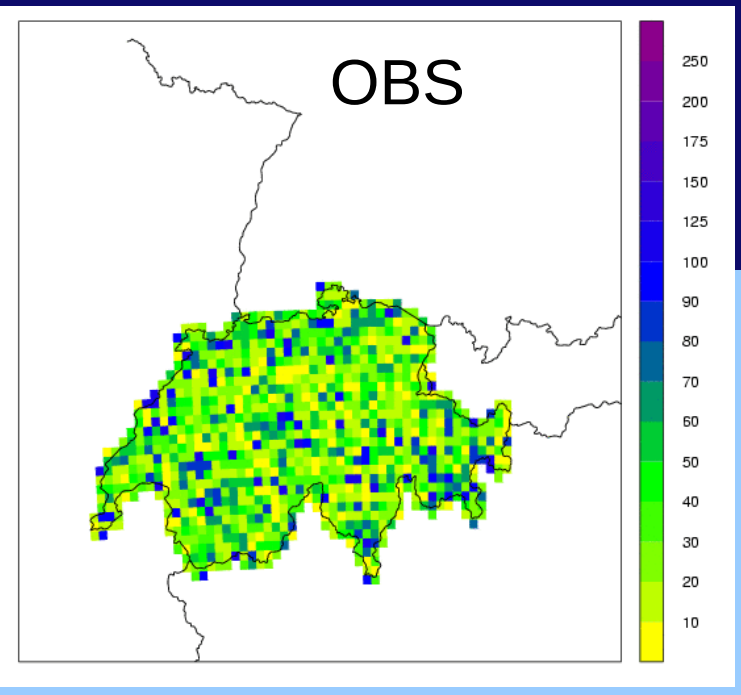
MOD

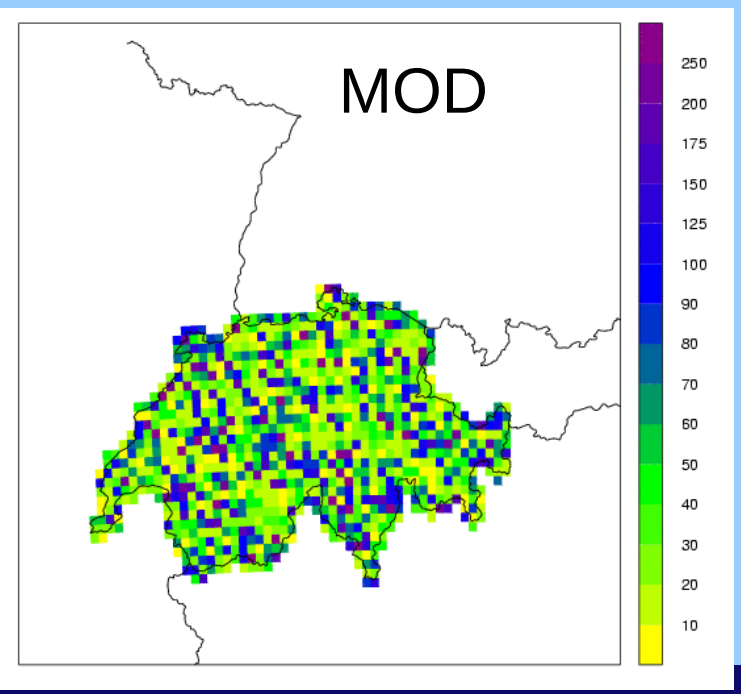


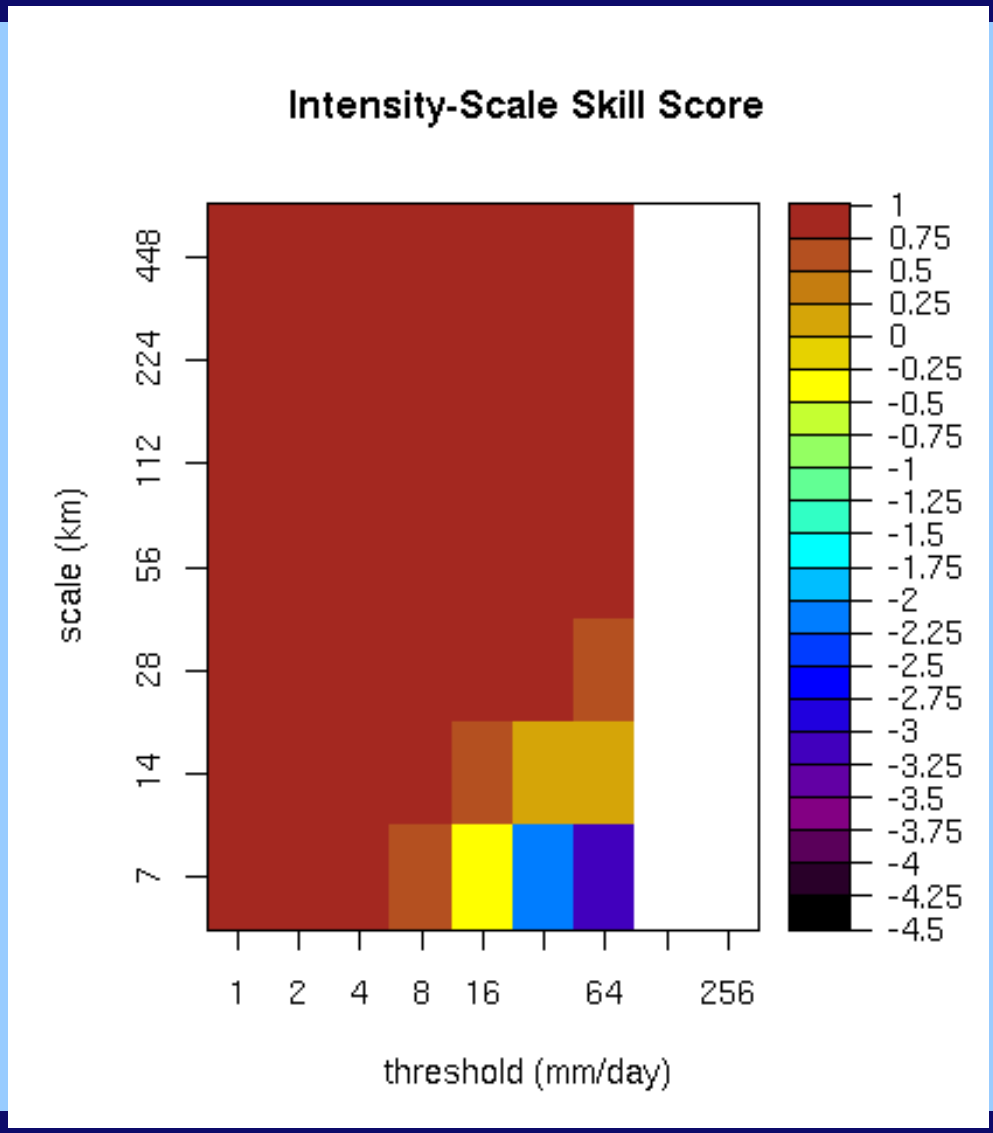
Exp1: resample the whole domain randomly



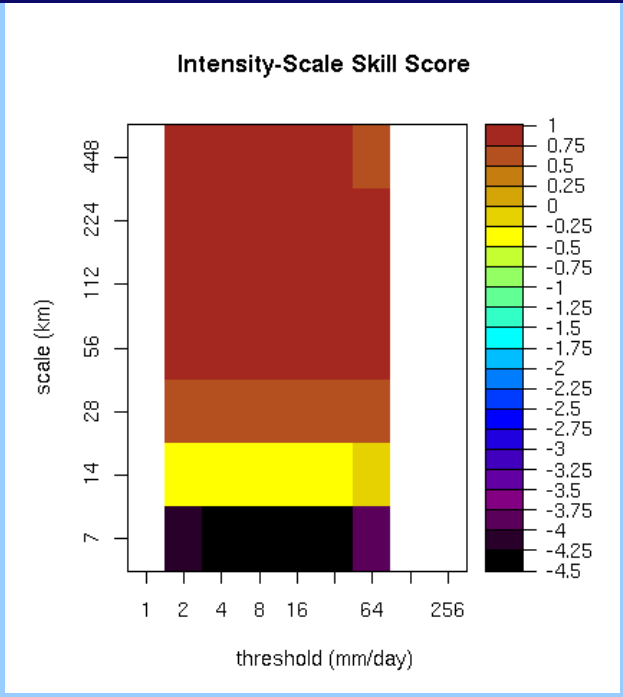
Exp2: resample the switzerland randomly



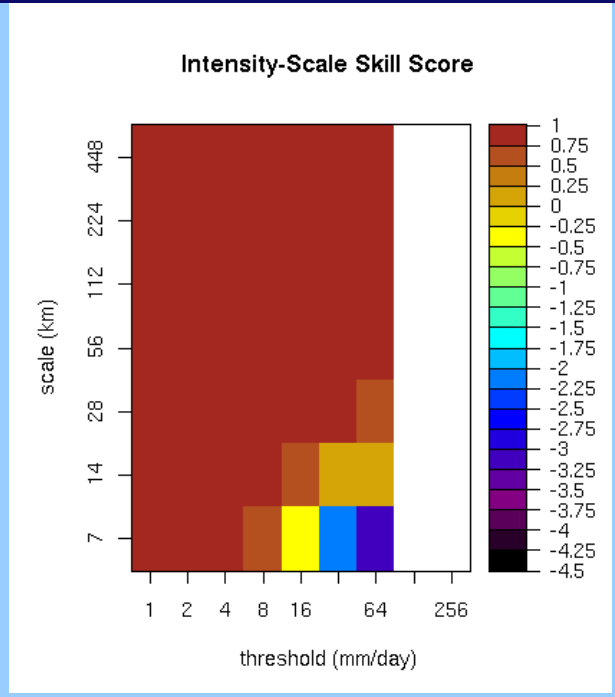




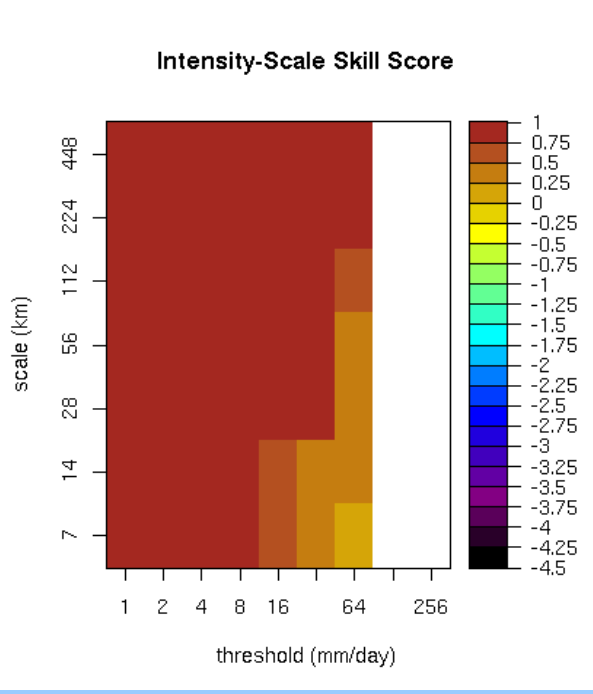
Resample all



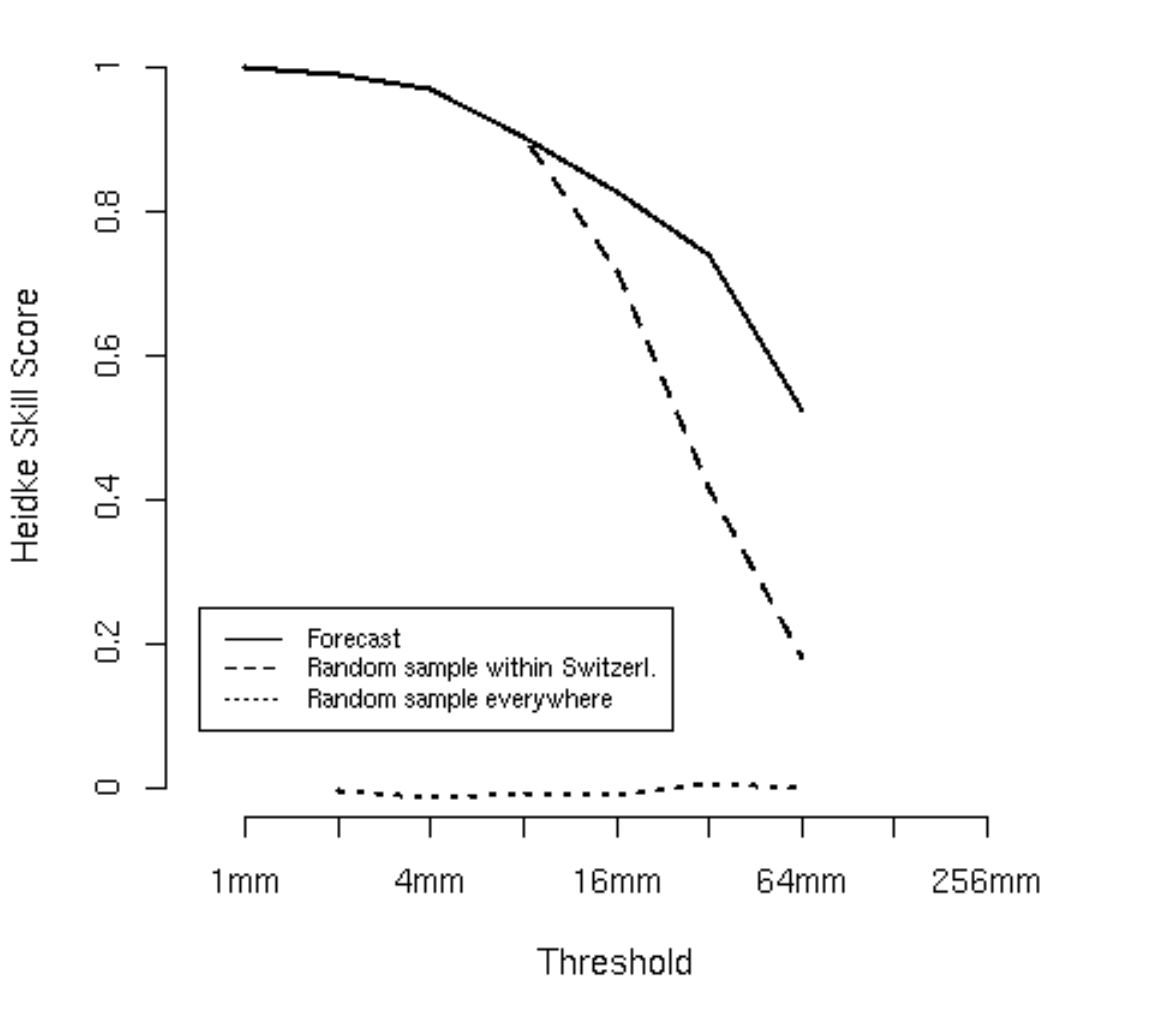
Resample inside



Normal



Heidke Skill Score (equal to the binary MSE skill score)



Conclusion

- irregular border with missing values outside leads to a spurious skill
- false skill predominantly present for low thresholds (beneath 8mm/day) and scales up to 60 km
- forecast of the COSMO model exhibits a good quality (especially for the strong intensities and small scales)