Region size matters - Statistical downscaling for more than a limited focus area

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The incentive for this presentation is the need to devise methods that enable a statistical regionalization to be applicable to a region the size of Central Europe.

Some of the concerns with respect to statistical climate modelling and statistical regionalization (for example using the WETTREG method) are based upon the perception that they are not „sufficiently universal", i.e. they need to be calibrated to areas of interest. In fact such models are performing satisfactorily for limited focus areas, e.g., the size of a few GCM grid points. But this is, of course, well below a desirable area the size of all of Central Europe. A re-calibration of the model for several focus areas is required, leading to a coverage of the climate conditions „in the adjacent valleys" which are only to a degree coupled to the other focus areas. On the order of 15 focus areas have been found necessary to cover Central Europe. The repeated re-calibration is justified by the fact that the linkages between the large scale climate conditions and the regional/local surface climate are region-dependent. There is, however, no need for the statistical modellers to be timid about this approach since RCM modellers also ponder a limited universality by way of the strategy of regionally specific parameterizations.

With the aim of minimizing the trade-off between locality and large area representativeness, a merging strategy will be presented that makes use of the information gained by producing the calibrated information not only for the focus area but for the set of all areas. This way, the „leakage" of information optimized for an area A to all other areas is retained. In a merging step, this manifold information is combined forming a data base that is by the same token regionally specific but takes adjacent specifications into account.

Examples using several classification schemes and climate indicators will be given.