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The Danish Climate Atlas: How to communicate climate change information at the local level

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The Danish Meteorological Institute is developing a nationally funded climate atlas for Denmark, presenting scenarios of future climate at the municipality level i.e. on a spatial scale of a few tens of kilometers. The aim is to facilitate climate change adaptation planning through communication of trustworthy information based on climate model results and observations.

The climate atlas will provide climate change scenarios for the near and far future. We use model data from the EURO-CORDEX-11 database, the HBM regional ocean model and the HARMONIE-Climate regional climate model. To account for model deficiencies, we perform bias correction of the climate model data. Climate scenarios for temperature, precipitation, wind, sea level as well as other variables will be available for the RCP4.5 and RCP8.5 emission scenarios. Special focus will be on future changes of extreme events, such as cloud bursts and storm surges, which represent threats to lives and properties. The detailed content of the climate atlas is being planned in collaboration with municipalities and utility companies.

Here we present considerations related to robust calculation of changes in mean values and extremes and discuss how to present results and related uncertainties in a user-friendly way. Uncertainties related to the climate model ensemble, the available observational data and the bias-adjustment methods are quantified. We also consider how to make the best use of ensemble information at various scales, e.g. how to extract the most plausible high-resolution information from a small set of very-high-resolution climate simulations in combination with the larger ensemble of EURO-CORDEX-11 simulations.