**Probabilistic forecasts of temperature and precipitation change based on global climate model simulations (CES deliverable 2.2)**

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**CHANGE FOR THREE EXAMPLE LOCATIONS**

**PROBABILISTIC FORECASTS OF CLIMATE CHANGE**

**Sources of Uncertainty in Climate Change Forecasts**

- **Observed climate**
- **Future climate**
- **Natural variability**
- **Models**
- **Emission scenarios**

A schematic view of sources of uncertainty in climate change as a function of time. In the future, most of the uncertainty relates to the magnitude of greenhouse gas emissions (unknown future behaviour of mankind) and differences between climate models (how climate responds to changes in atmospheric composition). In the short run, most of the uncertainty comes from natural variability.

**DATA AND METHODS**

The results shown here are based on simulations with 19 global climate models. This so-called CMIP7 data set is described by Meehl et al. (2007).

The probabilistic forecasts are generated using simulations for SRES A1B scenarios (Nakicenovic and Swart 2000). A resampling technique described by Knutti and Ruediman (2008) is used to increase the sample size. All climate changes are expressed as differences from the baseline 1971-2000.

The results take into account the uncertainty resulting from both climate model differences and natural variability. The uncertainty in emission scenarios is not included, but this is quite small for the near future.

**MAIN FINDINGS**

- High probability of warming, already in the next decade.
- Somewhat lower probability of precipitation increase, due to the relatively larger impact of natural variability.
- There is substantial quantitative uncertainty in climate change forecasts – do not neglect it.

**REFERENCES**

