

# Munich

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## CLIMATE SIMULATION

### Visualisation of extreme rainfall events

The ClimEx project is an international cooperation between research facilities, universities and public water agencies in Bavaria and Québec. It investigates the effects of climate change on meteorological and hydrological extreme events and implications for water management in both states. As part of this collaboration, possible scenarios regarding the climate trend between the years 1950 and 2099 were simulated. The SuperMUC of the Leibniz Supercomputing Centre completed the calculations of the simulation data.

The project partners selected three time intervals within the outcome of the simulation. Each interval contains 60 hours of data, which represent distinct rainfall events. The first of the three excerpts portrays the precipitation preceding the 1999 Pentecost flood. This event,

which draws upon historical meteorological data from 1999, serves as a point of reference for the remaining two events, which take place in 2060 and 2081. The Virtual Reality and Visualisation Centre preprocessed and prepared the raw numerical information for a clear and vivid presentation in a computer-generated three-dimensional space.

Apart from the rainfall data, the VR-application also contains a 3D-model of Bavaria, which was the result of combining a digital elevation model, provided by Bavarian Agency for Surveying and Geoinformation, with satellite pictures of Bavaria, taken by Sentinel-2. Additionally, the V2C added nameplates of the major Bavarian cities to the map, in order to facilitate threatened areas of high population density. To further put the data into context,

a slide show of historical pictures of the aftermath of the 1999 Pentecost flood are on display once the visualisation of its rainfall event concludes. These photographs are placed within the application at the location where they were originally taken.

This visualisation enables a comprehensible presentation of the consequences of climate change for laypersons and specialists alike.

<http://www.climex-project.org/>