



## **Climate Initiative Regional Climate Change (REKLIM), from climate simulation to climate advice**

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Interactions between atmosphere, ice, ocean and land surfaces determine the climate of the Earth. In recent years, global climate models have been used successfully to establish an initial understanding of large-scale natural climate variability and human influence on the climate. However, many processes that affect the climate at various scales are not well understood. At this time, there exists a broad consensus in the scientific community that there is a high probability that the current warming of the Earth is mainly caused by humankind, in particular as a result of the continuously increasing emissions of carbon dioxide from the intensive use of fossil fuels and changes to the land surface from agriculture, industry and settlements. As a result of this anthropogenic climate change, a significant global warming of approximately 3°C is expected in the next 100 years. However, the actual impacts for individual regions are still poorly understood. Whether climate change will determine, for example, that the summers will be drier or the winters will be wetter in a specific region has not been ascertained sufficiently through scientific investigation. For agricultural uses, however, this question is of crucial importance. For political and economic decision-making processes, detailed scenarios of the increase in sea levels, for example, are important to adapt coastal protection measures accordingly.

The Helmholtz Climate Initiative REKLIM (Regionale Klimaänderungen/Regional climate change) is a consortium of eight research centres within the German Helmholtz Association. REKLIM ([www.reklim.de](http://www.reklim.de)) is using its unique combination of the different institutional competence in regional observations and process studies (in situ observations, airborne and satellite remote sensing) coupled with model simulations to improve regional and global climate models, which provide a solid basis for climate-related decision support. Moreover, global climate simulations are used to determine the effects of climate variability and change on the regional scale with improved modelling tools for attribution and impact studies. On the other hand, process modules and parameterisations from these regional studies serve to improve global climate models. The Climate Initiative REKLIM will facilitate various scientific opportunities for improving knowledge of the regional Earth System, in particular with respect to impacts. Via the Helmholtz Regional Climate Offices ([www.klimabuero.de/index\\_en.html](http://www.klimabuero.de/index_en.html)) and the Climate Service Centre ([www.climate-service-center.de/index.html.en](http://www.climate-service-center.de/index.html.en)) policymakers and other decision makers will be supported in assessing risks and opportunities and designing mitigation and adaptation strategies.