



Dynamical downscaling: Principles, advantages, limitations and perspectives

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Dynamical downscaling usually refers to downscaling methods based on the use of physical models, such as nested limited area Regional Climate Models (RCMs) and variable resolutions global climate models (VARGCMs). During the last two decades considerable progress has been achieved in dynamical downscaling and its use for climate change studies. This paper reviews the principles underlying dynamical downscaling, its advantages and limitations, and its future perspectives. Open issues in dynamical downscaling techniques will be discussed, along with issues related to the use of these tools to produce climate change information useful for impact assessment and adaptation studies. In particular, the new international CORDEX initiative, aimed at developing a benchmark framework for improving downscaling models and applications, will be described. Final considerations will then be presented on future perspectives for this field of research.