



Convective phenomena at high resolution over Europe and the Mediterranean. The join EURO-CORDEX and Med-CORDEX flagship pilot study

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The join EURO-CORDEX and Med-CORDEX Flagship Pilot Study dedicated to the frontier research of using convective permitting models to address the impact of human induced climate change on convection, has been recently approved and the scientific community behind the project is made of 30 different scientific institutes distributed all around Europe.

The motivations for such a challenge is the availability of large field campaigns dedicated to the study of heavy precipitation events such as HyMeX and high resolution dense observation networks like WegnerNet, RdisagGH (CH), COMEPHORE (Fr), SAFRAN (Fr), EURO4M-APGD (CH); the increased computing capacity and model developments; the emerging trend signals in extreme precipitation at daily and mainly sub-daily time scale in the Mediterranean and Alpine regions and the priority of convective extreme events under the WCRP Grand Challenge on climate extremes, because they carry both society-relevant and scientific challenges.

The main objective of this effort are to investigate convective-scale events, their processes and their changes in a few key regions of Europe and the Mediterranean using convection-permitting RCMs, statistical models and available observations. To provide a collective assessment of the modeling capacity at convection-permitting scale and to shape a coherent and collective assessment of the consequences of climate change on convective event impacts at local to regional scales.

The scientific aims of this research are to investigate how the convective events and the damaging phenomena associated with them will respond to changing climate conditions in several European regions with different climates. To understand if an improved representation of convective phenomena at convective permitting scales will lead to upscaled added value and finally to assess the possibility to replace these costly convection-permitting experiments with statistical approaches like "convection emulators".

The common initial domain will be an extended Alpine domain and all the groups will simulate a minimum of 10 years period with ERA-interim boundary conditions, with the possibility of other two sub-domains one in the Northwest continental Europe and another in the Southeast Mediterranean.

The scenario simulations will be completed for three different 10 years time slices one in the historical period, one in the near future and the last one in the far future for the RCP8.5 scenario.

The first target of this scientific community is to have an ensemble of 1-2 years ERA-interim simulations ready by next summer.