



Conditional attribution of an extreme event of precipitation in Austria in June 2009: a modelling approach with COSMO-CLM at convection-permitting resolution

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In June 2009, a persistent cut-of low over the Adriatic basin brought warm and moist air to Austria, resulting in a series of heavy thunderstorms responsible for extreme landslides and strong local impacts.

This presentation addresses the question of the attribution to climate change of this extreme event of precipitation. While classical event attribution aims to quantify both dynamic and thermodynamic changes by large ensemble simulations, which fails when the event is strongly governed by atmospheric circulation, we choose a conditional approach: how severe would this event have been in a colder climate, given the same large-scale circulation? By doing so, the dynamical effect is mostly eliminated and only the effect of warming is studied.

Similarly, future storylines are produced. We simulate how the 2009 extreme event of precipitation in Austria might manifest in a warmer climate, based on a pseudo global warming approach, using the climate change signal extracted from the EURO-CORDEX ensemble.

This presentation introduces the modeling approach and challenges of the conditional attribution approach and the storyline approach under projected future conditions with high-resolution simulation over a complex terrain. A chain of simulations with increasing resolution is conducted with the regional climate model COSMO-CLM: 12km over the European domain, 3km in the Eastern Alpine region and 1km in South-Eastern Austria. First results will be presented.