

**PARALLEL SESSION A : BENEFITS OF DOWNSCALING  
A1: ADDED VALUE OF DOWNSCALLING**

**Quantifying the overall added value of dynamical downscaling and the contribution from different spatial scales**

**Alejandro DI LUCA**

University of New South Wales - Australia

As shown by a large number of studies, the finding of “mixed results” where RCMs produce some improvements but also deteriorations compared to the driving data is relatively common in added value studies. A question that remains open is which of these two situations is more dominant. That is, whether we can quantify if RCMs produce in general –independently of the statistic chosen– an overall improvement over the driving data.

In this presentation, we will present results from a study that evaluates the added value in the representation of surface-climate variables from an ensemble of RCM simulations by comparing the relative skill of the RCM simulations and their driving data over a wide range of RCM experimental setups and climate statistics. The methodology is specifically designed to compare results across different variables and metrics, and it incorporates a rigorous approach to separate the added value occurring at different spatial scales.

Results show that the RCMs added value strongly depends on the type of driving data, the climate variable and the region of interest, but depends rather weakly on the choice of the statistical measure, the season and the RCM physical configuration. Decomposing climate statistics according to different spatial scales shows that improvements are coming from the small scales when considering the representation of spatial patterns, but from the large-scale contribution in the case of absolute values.

Alejandro Di Luca<sup>1</sup>, Daniel Argueso<sup>1,2</sup>, Jason Evans<sup>1,2</sup>, Ramón de Elía<sup>3,4</sup> and René Laprise<sup>4,5</sup>

<sup>1</sup> Climate Change Research Centre, Faculty of Science, University of New South Wales, Sydney, Australia;

<sup>2</sup> ARC Centre of Excellence for Climate System Science, University of New South Wales, Sydney, Australia;

<sup>3</sup> Consortium Ouranos, Montréal, Canada; <sup>4</sup> Centre pour l'Étude et la Simulation du Climat à l'Échelle Régionale (ESCER), Montréal, Canada; <sup>5</sup> Université du Québec à Montréal (UQAM), Montréal, Canada.