Oral.4: **16:45-17:00. Sensitivity of convective precipitation to warming in the extratropical Andes**

[1,2,3]**Miguel Lagos-Zúñiga**, [4,1]**Deniz Bozkurt** and [5,1]**Roberto Rondanelli**

[1] *Center for Climate and Resilience Research, University of Chile*
[2] *Advanced Mining Technology Center, University of Chile*
[3] *Civil Engineering Department, University of Chile*
[4] *Meteorology Department, University of Valparaiso*
[5] *Geophysical Department, University of Chile*

contact: mlagosz@uchile.cl

Abstract

Deep convective activity in the extratropical Andes is intense during austral summer and can produce severe precipitation events that may induce localized flooding and landslides due to the relatively high temperatures and zero-isotherm lifting. Summer precipitation events are commonly triggered by high water vapor availability and enhanced instability due to surface warming and(or) cooling in the mid-to-upper tropospheric levels. In this study, we aim to explore the sensitivity of convective precipitation to warmer sea surface and air temperatures for the two historical events: i) a Cut Off Low event (COL, February 2017), and ii) an Atmospheric River + COL (January 2019). Both cases are analyzed in the region between 30-35°S along the Andes. We use the Weather Research and Forecasting Model (WRF) at a convective permitting 3 km horizontal resolution to obtain dynamically downscaled high-resolution simulations. We first obtain a control simulation using GFS initial and boundary conditions. We evaluate control simulations through surface and upper-air observations. The warmer conditions are evaluated with three warmer SST and/or troposphere conditions with modified forcings through a pseudo-global warming experiment based on CMIP6 simulations (SSP5-8.5 scenario). We explore precipitation sensitivities in magnitude and affected areas to analyze the potential enhanced risk of summer precipitation events due to warmer conditions.