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**PARALLEL SESSION B : FRONTIER DOWNSCALING TOOL**
**B1: VERY HIGH RESOLUTION MODELLING**

# Does convection-permitting resolution improve simulated precipitation in the Maritime Continent?

**Daniel ARGUESO**

Climate Change Research Centre, UNSW - Australia

The Maritime Continent has consistently been identified as a challenging region in terms of simulating precipitation. Its intricate configuration of islands with complex topography surrounded by a warm and shallow ocean makes this tropical archipelago an unequaled setting to test potential benefits of very high-resolution models. In this study, we focus on the western Maritime Continent to determine features of precipitation that are better represented with increased horizontal resolution, as well as those characteristics that deteriorate at finer grid spacing.
We investigated the impact of spatial resolution on rainfall amounts and diurnal cycle using the Weather Research and Forecasting model. A set of simulations running over a 5-year period at resolutions of 50, 10 and 2 km were completed and compared against satellite-derived observational products. While annual biases over the mountains are larger as resolution increases, our results suggest that precipitation is physically more realistic in the convection-permitting experiment performed at 2-km grid spacing. For example, the shape and phase of the diurnal cycle in the region, which are traditionally misrepresented in models, are substantially improved at higher resolution when comparing with the observational datasets. The amplitude of the diurnal cycle is also improved over most areas, although deficiencies still exist in that the strength of the cycle is overestimated.

In this talk, the resolution dependence of near-surface temperature, 10-m winds and cross-sections of different variables will also be analyzed. As a result, possible mechanisms that contribute to better simulating aspects of precipitation will be put forward, such as finer representation of the land-sea thermal contrast and the local circulation.

Daniel Argueso[1,2], Alejandro Di Luca[2], Jason P. Evans[1,2]

[1]ARC Centre of Excellence for Climate System Science, University of New South Wales, [2]Climate Change Research Centre, University of New South Wales