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# Sensitivity of the Maritime Continent precipitation to horizontal resolution in a coupled regional model

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The Maritime Continent (MC) is centred at one of the major monsoon systems in the world. Characterized by massive tropical heating and precipitation, it is strongly influencing both the Hadley and Walker circulations. However, there are significant challenges in correctly represent climate of this region because of the complex topography and the arrangement of lands and seas. It is often argued that improved representation of the diurnal cycle over islands and the complex mesoscale circulation associated with land-sea contrast is important to energy and hydrological cycles of this region.

To investigate the sensitivity of precipitation over the MC to model horizontal resolution, we perform three regional numerical experiments using the coupled NEMO-OASIS-WRF model at different horizontal resolutions of 3/4°, 1/4° and 1/12° in both atmosphere and ocean components. The 3/4° and 1/4° experiments are run on a large MC domain for 21 years (1989 to 2009), and the 1/12° experiment is nested within the 1/4° domain using two-way interactive nesting over 5 years.

Increasing the resolution reduces biases in mean SST and mean precipitation. The precipitation distribution is also improved at higher resolution, particularly in coastal areas. A part of these improvements are related to different behaviours of the model physical schemes across the three resolutions. Other changes are interpreted in terms of land-sea breeze, that we describe through a new comprehensive method.