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Understanding climate change in Brunei Darussalam and Borneo: Past trends and future projections

Fredolin Tangang and Nurul Huda Ramli
Universiti Brunei Darussalam, Brunei Darussalam

Abstract

This poster showcases preliminary findings from a research project that the Universiti Brunei Darussalam (UBD) Climate Change Modelling Consortium has recently embarked on. Recent studies indicate that Borneo may face a higher likelihood of extreme weather and climate events, including heat waves, droughts, and heavy rainfall, in the coming decades as global warming intensifies (Tangang et al., 2020; Supari et al., 2020; Yi et al., 2025). The magnitude of increases may not be as high if the world is able to drastically limit greenhouse gas (GHG) emissions and reduce the global annual emissions by 50% in 2030 to around 25 – 30 $GtCO_2$-eq and achieve a net zero CO2 by 2050 for the global mean temperature to stabilise around 1.5 °C above the pre-industrial levels. However, the likelihood of successful global mitigation under the Paris Agreement decreases as current commitments and policies put the Earth on a trajectory of more than 3 °C above pre-industrial levels by 2100 (IPCC, 2023). As much as the need to strengthen mitigation efforts, the focus on adaptation in critical sectors must be strengthened as well. This is indeed the case for Borneo and Brunei; adapting to the impacts of future climate change for climate resilience is one of the key strategies of the Brunei National Climate Policy (BNCCP). However, adaptation measures are implemented locally, and future climate projections must be available at these scales. For Brunei, this project aims to conduct further downscaling and produce climate change information at scales suitable as inputs to various impact models for sectors such as agriculture, health, and climate disaster risk reduction. Available gridded datasets indicated that most areas in Borneo, including Brunei, have experienced a temperature increase of around 1.0 °C since the early 1980s. Significant trends are also found for extreme indices, including extreme rainfall frequency and intensity. These trends are likely to continue as global warming intensifies in the coming decades. Overall, this project, while still in its early stages, aims to produce robust future climate projections at local scales for adaptation and informed policy development, to support the National Climate Vulnerability Assessment (NCVA).

References/ Publications

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