

## The Potential Impacts of Climate Change on Air Quality in the Upper Northern Thailand

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**Abstract :** In this study, the Weather Research and Forecasting (WRF) model was used as regional climate model to dynamically downscale the ECHAM5 Global Climate Model projection for the regional climate change impact on air quality-related meteorological conditions in the upper northern Thailand. The analyses were focused on meteorological variables that potentially impact on the regional air quality such as sea level pressure, planetary boundary layer height (PBLH), surface temperature, wind speed and ventilation. Comparisons were made between the present (1990-2009) and future (2045-2064) climate downscaling results during majority air pollution season (dry season, January-April). Analyses showed that the sea level pressure will be stronger in the future, suggesting more stable atmosphere. Increases in temperature were obvious observed throughout the region. Decreases in surface wind and PBLH were predicted during air pollution season, indicating weaker ventilation rate in this region. Consequently, air quality-related meteorological variables were predicted to change in almost part of the upper northern Thailand, yielding a favorable meteorological condition for pollutant accumulation in the future.

**Keywords :** climate change, climate impact, air quality, air pollution, Thailand

**Conference Title :** ICECC 2015 : International Conference on Environment and Climate Change

**Conference Location :** Paris, France

**Conference Dates :** September 21-22, 2015