

## ABSTRACT

Black carbon (BC), light absorbing carbon (LAC), or soot is a known component of air particulate matter and has been identified as the second top contributor to global warming due to its strong positive radiative forcing (He *et al.*, 2019). In the Philippines, specifically in the National Capital Region (NCR), increased black carbon concentrations have been observed coming from public utility vehicles (PUVs), particularly from jeepneys (Kecorius *et al.*, 2017). As such, increased absorption of solar radiation is expected, which can result to a warming effect in the region. The aim of the study is to investigate the relationship between BC concentrations and regional warming. BC data from PM<sub>10</sub> will be gathered from the long-term monitoring stations of DENR-EMB from 2014 - 2021 at different sampling stations in NCR, namely, DOH, Muntinlupa, MMDA, Mandaluyong, Marikina, and NPO. A multi-wavelength absorption black carbon instrument (MABI) will be employed to specifically measure the BC concentrations at seven different wavelengths. These wavelengths will be further utilized to determine the absorption Ångström exponent of BC. Furthermore, the simulation of solar spectrum and calculated direct and diffused irradiation at the sampling sites will be evaluated using the tropospheric ultraviolet and visible (TUV) radiation model, incorporating local parameterization. The history of the flow of air mass will also be assessed using the HYSPLIT back trajectory model. An increasing trend of BC concentration is expected all throughout the sampling years due to a continuous increase in traffic volume in NCR. However, BC concentration is expected to have a decline in trend during the year of 2020 when pandemic lockdowns have restricted the number of PUVs plying the roads of NCR. Consequently, this will reduce regional warming around the sampling locations.