Figure S1. Backward trajectories (24-hour) of plumes arriving in Boracay in September 2019. Most of the plumes originated from the southwest, coherent with general wind circulation (Habagat) during this period.
Figure S2. Monthly spatial profile of organic carbon (OC) in South East Asia. There was an evident transport of OC in September 2019, coming from SEA countries and south of the Philippines.
Figure S3. Time series profile of PM$_{2.5}$ in Southern Philippines from ground-based measurement and simulated surface concentration from satellite data (MERRAero). Included in the figure is the profile of OC, which had a prominent enhancement in September 2019. The shaded region is the period when elevated PM$_{2.5}$ mass concentration, attributed to the transport of combustion plume from SEA countries and south of Philippines. More information regarding this site can be found in a prior study (Salvador et al., 2022).
**Figure S4.** Ratio of BC attributed to vehicle and biomass burning. Each symbol represents a daily measurement collected separately on Manila and Boracay on different days.

**References**