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# Unexpected increasing AOT trends over north-west Bay of Bengal in the early post-monsoon season

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The main point of our study is that aerosol trends can be created by changes in meteorology, without changes in aerosol source strength. Over the ten-year period 2000 – 2009, in October, MODIS showed strong increasing aerosol optical thickness (AOT) trends of approximately 14 % per year over north-west Bay of Bengal (BoB) in the absence of AOT trends over the east of the Indian subcontinent. This was unexpected, because sources of anthropogenic pollution were located over the Indian subcontinent, and aerosol transport from the Indian subcontinent to north-west BoB was carried out by prevailing winds. In October, winds over the east of the Indian subcontinent were stronger than winds over north-west BoB which resulted in wind convergence and accumulation of aerosol particles over north-west BoB. Moreover, there was an increasing trend in wind convergence over north-west BoB. This led to increasing trends in the accumulation of aerosol particles over north-west BoB and, consequently, to strong AOT trends over this area. Our analysis showed that natural aerosols, neither desert dust no sea-salt aerosol, are likely to be the cause of the AOT trends over north-west BoB in October. These increased AOT trends over north-west BoB in October indicate an increase in anthropogenic pollution over the sea. In contrast to October, November showed no increasing AOT trends over north-west BoB or the nearby Indian subcontinent. The lack of AOT trends over north-west BoB corresponds to a lack of trends in wind convergence in that region. Finally, December domestic heating by the growing population resulted in positive AOT trends of similar magnitude over land and sea. Our findings illustrate that, in order to explain and predict trends in regional aerosol loading, meteorological trends should be taken into consideration together with changes in aerosol sources.