Ozone and Nitrogen Dioxide Pollution in a Coastal Urban Environment: The Role of Sea Breezes, and Implications of their Representation for Remote Sensing of Local Air Quality

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SUPPLEMENTAL MATERIAL

This file contains Table S1, Figure S1, S2, S3, S4, and S5.

Table S1: Frequency of occurrence (in days) of the prevailing meteorological conditions identified each year June through August from 2010-2019.

	Sea Breeze	Westerly	Easterly
2010	24	44	18
2011	31	32	19
2012	31	38	14
2013	31	40	14
2014	34	35	14
2015	29	31	21
2016	25	43	19
2017	24	41	16
2018	29	32	25
2019	25	38	21
Average	28.3	37.4	18.1

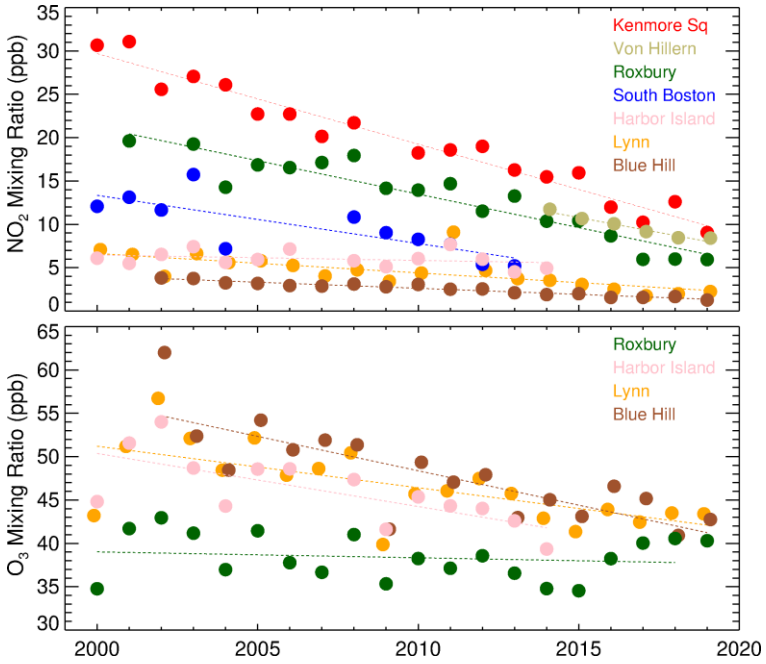

Figure S1: Annual summer midday average NO_2 (top) and annual summer mean daily maximum 8-hr average O_3 (bottom).

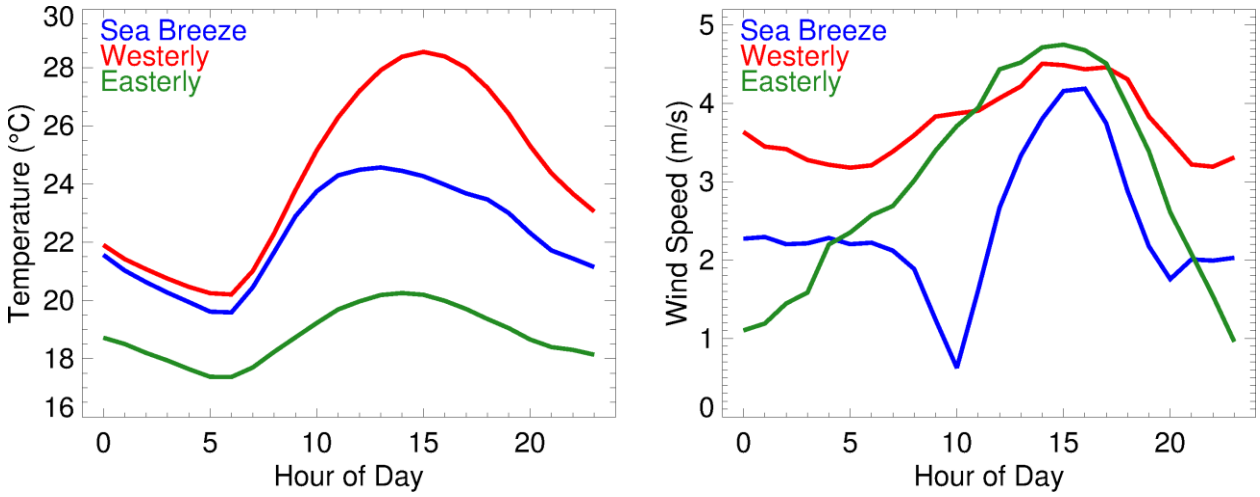

Figure S2: Mean diurnal evolution of surface temperature and wind speed throughout the day at Logan Airport for each predominant meteorological category (June-July-August, 2010-2019).

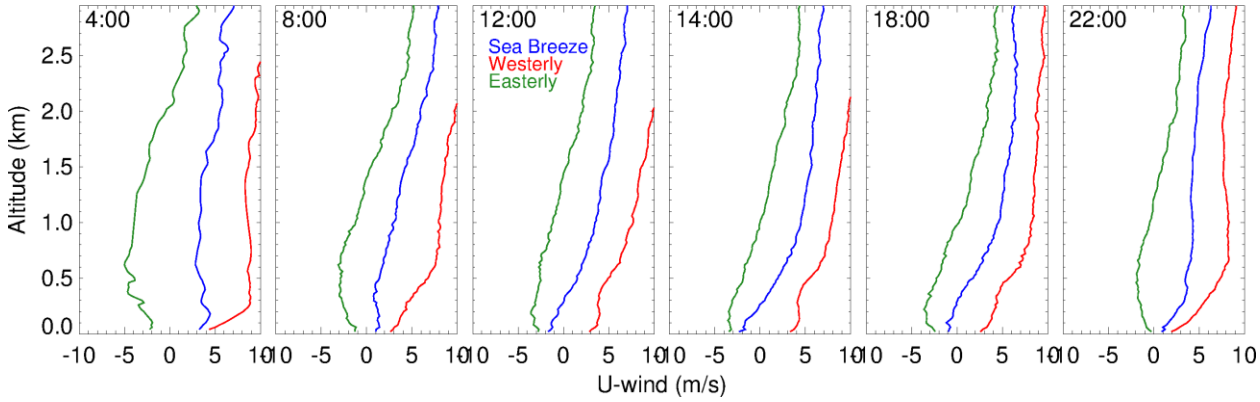

Figure S3: Vertical profiles of U- (horizontal) wind component (June-July-August 2010-2019) from Logan Airport processed AMDAR observations. At 14:00 LT on sea breeze days, we note the reversal of winds from easterly (negative values) to westerly (positive values) at an altitude of around 300 m.

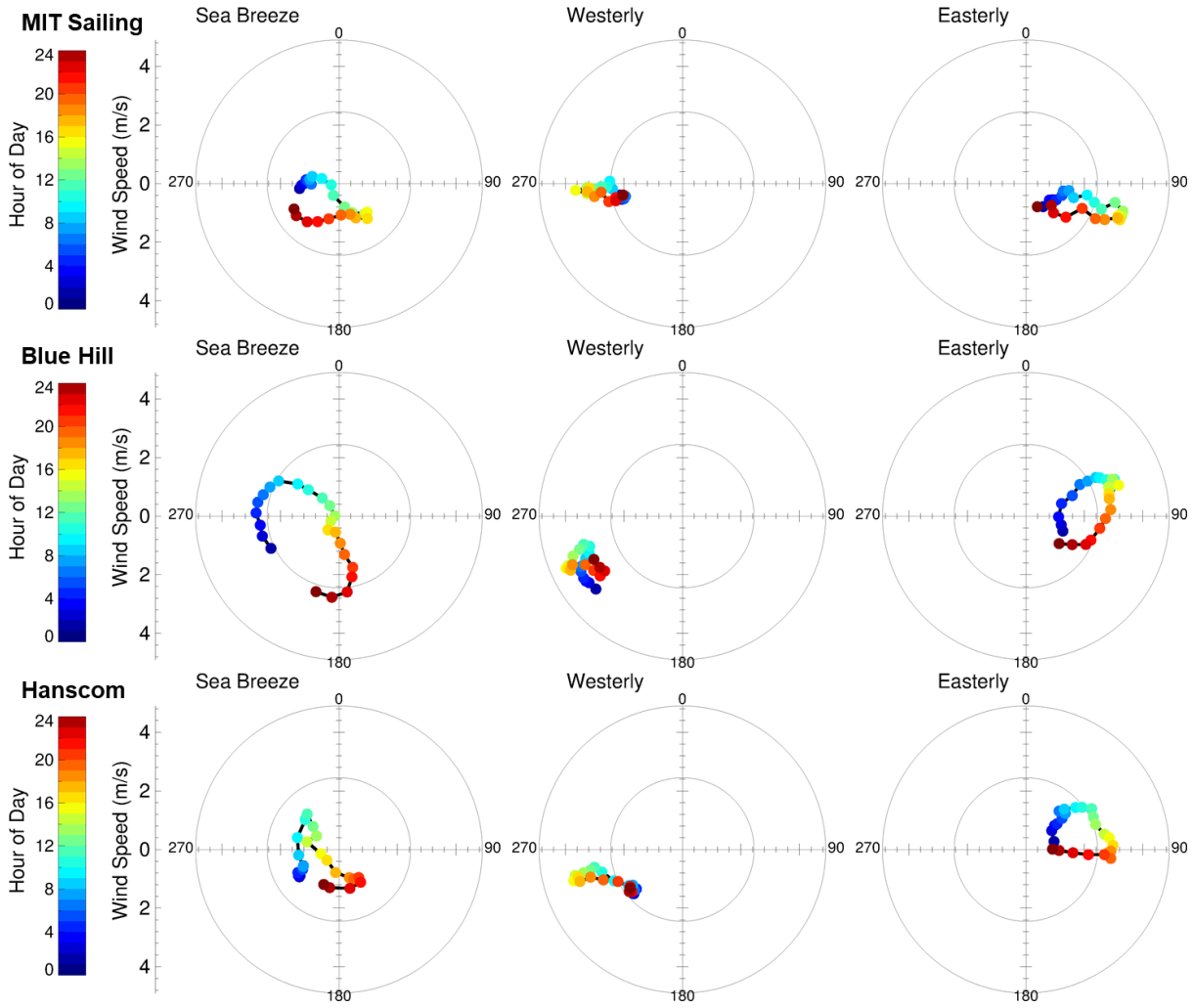

Figure S4: Meteorological conditions at MIT Sailing Pavilion (top), Blue Hill (middle), and Hanscom (bottom) on days identified as westerly, easterly, or sea breeze days according to the Logan Airport observations (June-July-August 2010-2019).

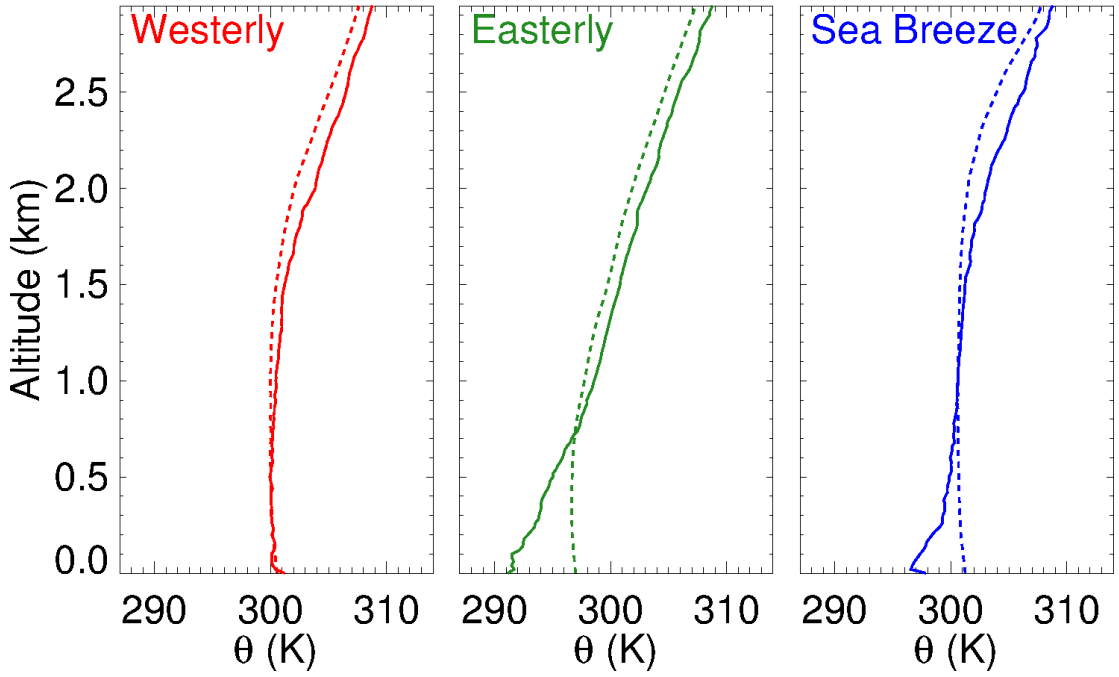

Figure S5: Vertical profiles of potential temperature from the MERRA-2 meteorological reanalysis (dashed lines) and the Logan Airport processed AMDAR observations (solid lines), separated by prevailing meteorology identified on each day (June-July-August 2016).