

**Investigating Impacts of Local Circulation on Coastal Ozone Pollution in the New York
Metropolitan Area: Evidence from Multi-year Observations**

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Introduction

This supporting information file contains seven figures and one table that are not incorporated in the manuscript.

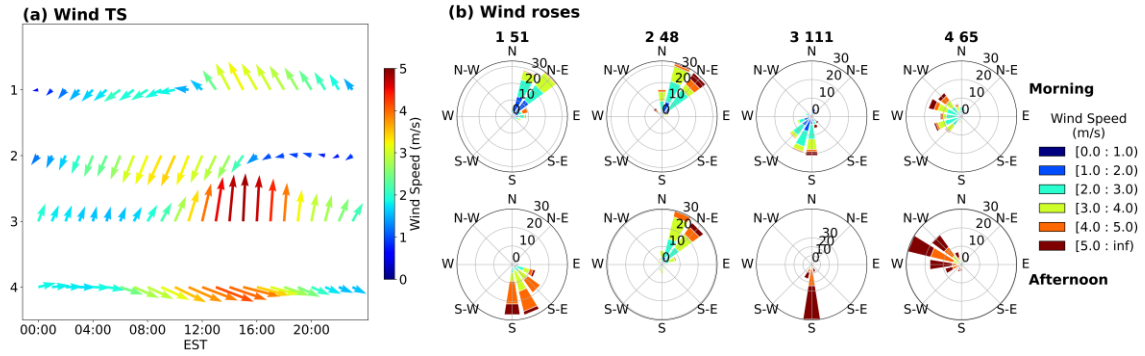


Figure S1. Wind clusters at QUEE based on features in Li et al. (2020). (a) diurnal cycles of mean wind for wind clusters 1-4; (b) early morning (04:00-06:00, top panels) and afternoon (14:00-16:00, bottom panels) wind roses for each wind cluster. The number of days in each cluster is shown in (b). The mixed wind speed and directions in (b), compared with the results in Figure 4, demonstrated the effectiveness of the new features used for wind clustering.

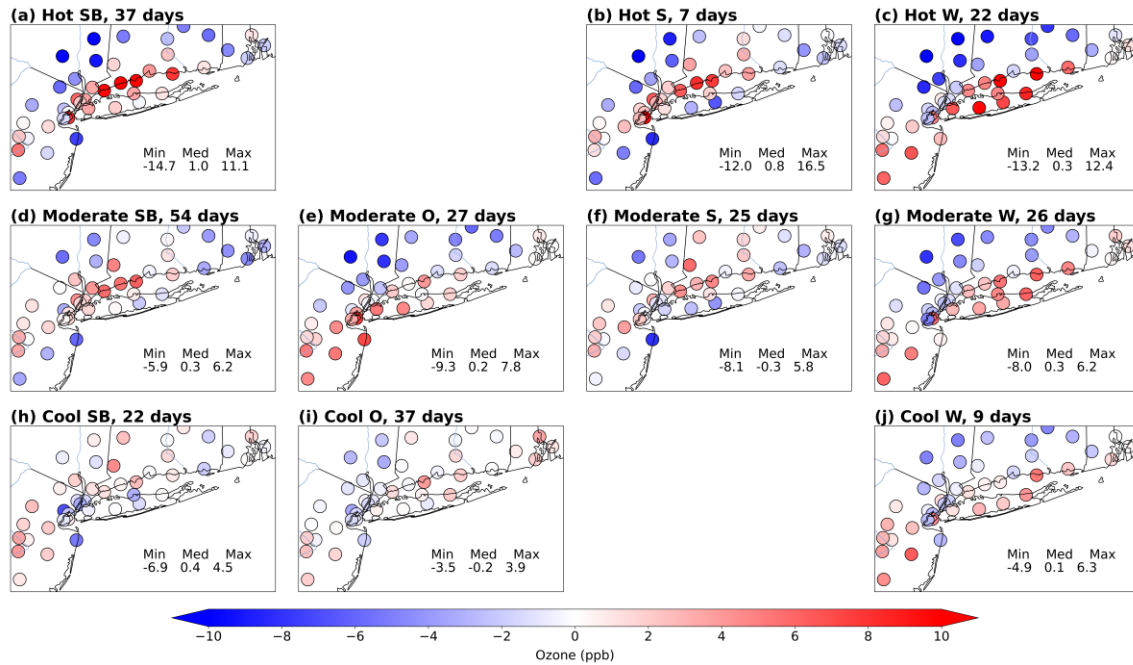


Figure S2. DMA8 spatial anomaly derived by subtracting all-site mean DMA8 from individual average DMA8 for each cluster with at least six days during the summertime (JJA) of 2017-2019.

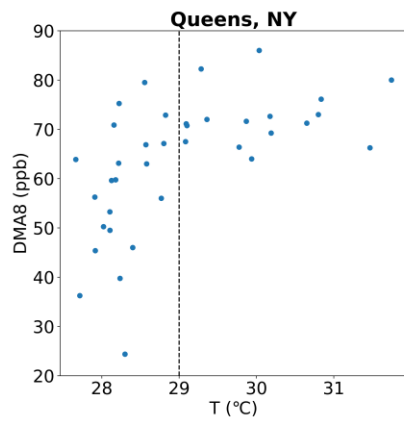


Figure S3. Dependence of DMA8 at Queens on regional daytime temperature on *Hot SB* days.

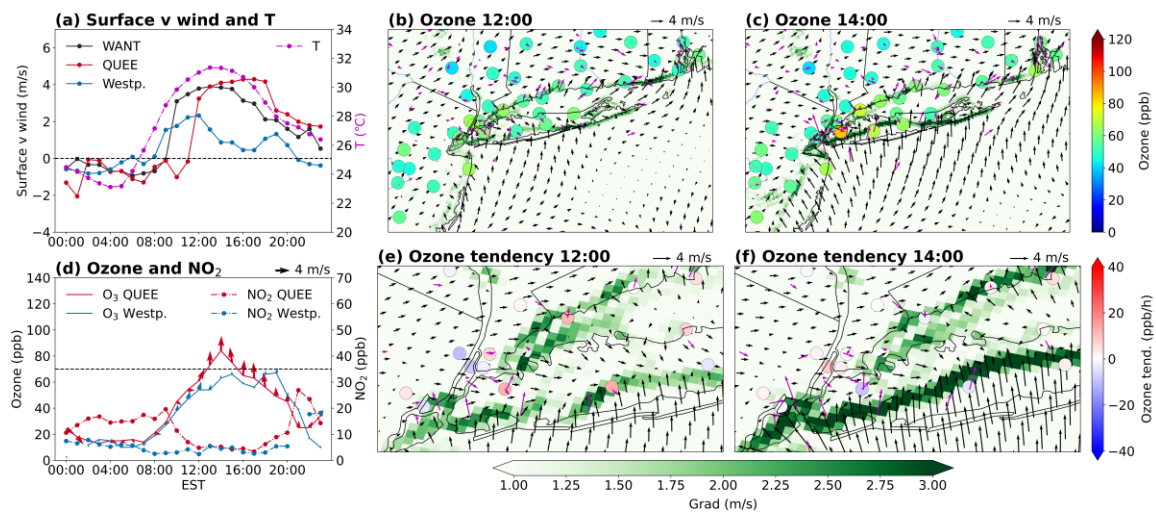


Figure S4. Abrupt strong sea breeze onset case on Aug. 5, 2018. See caption in Figure 12.

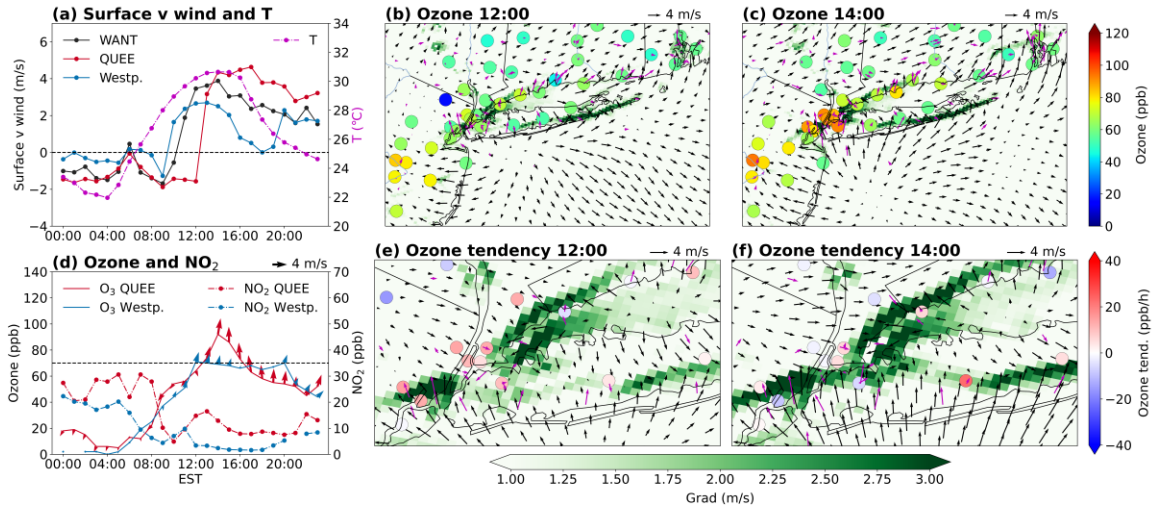


Figure S5. Abrupt strong sea breeze onset case on Jun. 28, 2019. See caption in Figure 12.

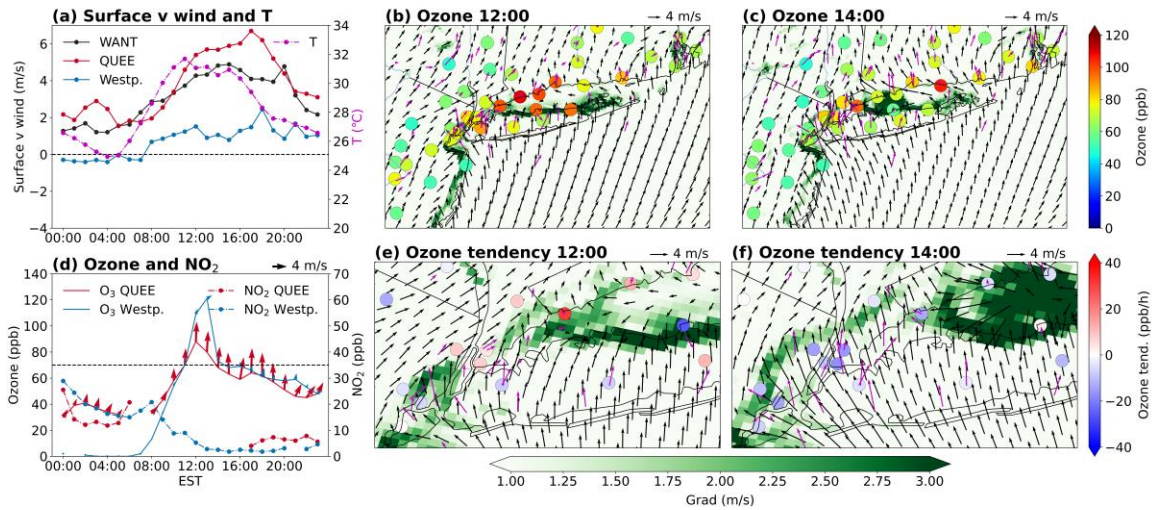


Figure S6. Gradual weak sea breeze onset cases on Jul. 30, 2019. See caption in Figure 12.

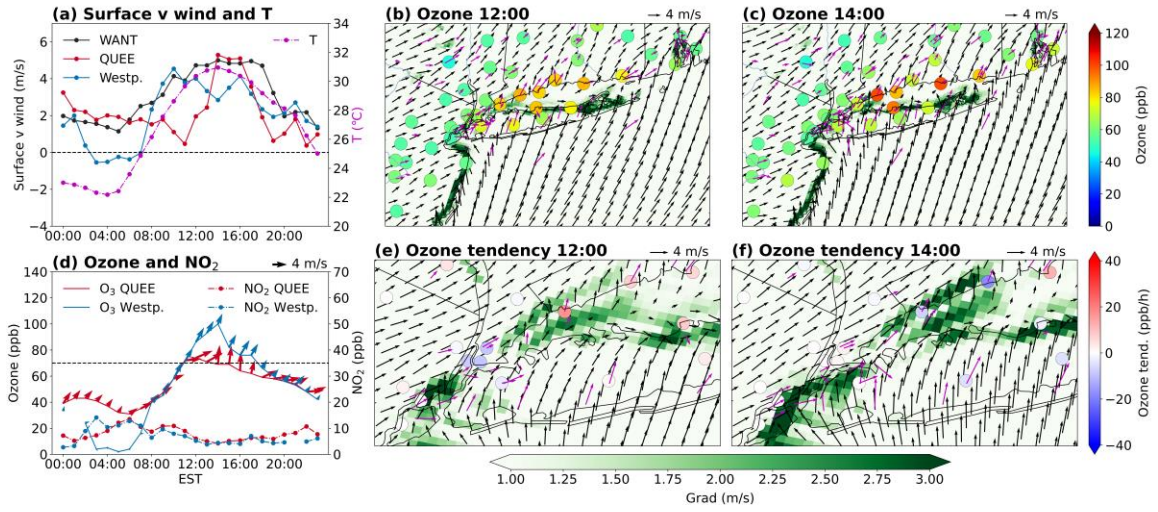


Figure S7. Gradual weak sea breeze onset cases on Jul. 28, 2019. See caption in Figure 12.

63 **Table S1.** Meteorological and ozone conditions for 37 *Hot SB* days.
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YYYY MMDD									Queen, NY			Westport, CT		
	<i>SB_ OnT</i> (EST hr)	<i>SB_ dV</i> (m/s)	<i>SB_ Str</i> (m/s)	<i>SB_ Depth</i> (m)	<i>U_ am</i> (m/s)	<i>V_ am</i> (m/s)	<i>T</i> (°C)	<i>dT</i> (°C)	<i>SB_ ArrT</i> (EST hr)	<i>DMA8</i> (ppb)	<i>O₃- max</i> (ppb)	<i>SB_ ArrT</i> (EST hr)	<i>DMA8</i> (ppb)	<i>O₃- max</i> (ppb)
20170611	8	0.8	2.1	1000	1.2	1.4	28.2	9.7	11	70.9	81	8	79.4	97
20170612	9	2.4	2.1	1100	1.2	0.8	30.0	9.8	14	86.0	91	9	97.8	107
20170719	11	1.0	2.8	1000	1.5	1.5	29.9	5.2	15	64.0	73	9	73.6	101
20170720	10	1.2	3.7	1000	0.7	0.0	30.8	5.5	14	73.0	92	8	90.1	110
20170722	9	3.2	4.5	700	0.1	-1.5	28.6	3.1	12	79.5	94	10	50.8	56
20170801	10	2.8	4.0	800	0.2	-0.8	28.2	4.2	12	75.3	93	9	59.1	87
20170822	14	0.9	3.8	1000	1.0	1.7	27.7	3.1	8	36.3	45	-	58.4	74
20180630	9	3.9	4.3	1300	1.1	-1.0	30.2	6.1	10	72.6	79	9	60.0	64
20180701	11	3.9	3.0	900	1.3	-0.4	31.7	7.2	14	80.0	113	12	-	-
20180702	15	1.3	3.3	200	-0.3	0.1	30.8	5.8	10	76.1	85	8	-	-
20180703	8	1.4	0.2	500	0.1	1.0	28.4	3.9	10	46.0	61	17	60.1	69
20180704	10	0.7	2.4	600	0.5	0.3	28.2	2.6	11	39.8	54	17	54.8	63
20180705	8	1.2	2.5	400	1.2	0.9	28.3	2.6	11	24.4	34	16	42.4	61
20180710	8	2.2	3.1	1400	1.5	0.3	29.3	7.0	13	82.3	98	8	94.5	114
20180714	8	1.4	2.6	600	1.6	1.1	27.7	5.2	12	63.9	74	8	77.5	91
20180716	8	1.3	1.8	600	1.0	0.7	29.1	5.2	11	71.1	91	16	77.9	96
20180805	10	3.2	4.5	800	1.0	-0.7	29.8	4.0	12	66.4	84	8	60.6	67
20180806	10	3.0	3.9	900	1.2	0.0	30.7	4.5	10	71.3	85	17	77.3	88
20180808	8	1.0	2.8	400	0.8	0.2	28.8	3.0	10	67.1	86	8	84.6	107
20180810	10	3.2	4.1	1900	0.9	-0.3	28.2	2.0	13	63.1	78	9	58.4	67
20180817	14	1.1	4.4	500	1.0	0.9	28.8	3.1	15	56.0	66	14	66.3	91
20180827	11	3.3	3.9	700	1.6	-0.1	28.2	4.0	15	59.8	79	10	64.5	71
20180828	9	1.2	2.8	1300	1.4	0.9	31.5	6.4	13	66.3	81	8	84.5	110
20190628	11	2.4	4.3	1000	0.0	-0.7	29.1	4.7	13	70.8	92	9	68.0	71
20190629	8	0.5	2.4	300	1.2	1.0	28.8	4.7	12	72.9	82	12	70.1	75
20190704	16	0.7	2.3	400	-0.6	0.1	28.6	4.9	10	63.0	71	17	84.0	98
20190710	9	2.8	4.1	600	1.1	-0.2	28.6	4.7	14	66.9	81	8	67.3	80
20190716	10	1.1	5.4	700	0.0	-0.5	29.4	5.0	13	72.0	84	8	90.6	111
20190719	9	1.9	5.4	1400	0.3	-0.6	27.9	4.2	12	56.3	63	13	72.4	102
20190722	15	0.9	0.9	1900	-1.0	0.0	28.1	2.0	12	53.3	59	17	50.8	59
20190728	10	1.0	3.0	900	1.6	1.2	29.1	4.3	14	67.5	74	8	81.3	100
20190729	11	0.7	2.6	1100	1.0	0.7	29.9	5.1	13	71.6	84	8	88.3	107
20190730	8	0.6	1.9	700	1.2	1.1	30.2	5.1	11	69.3	88	17	79.6	121
20190818	15	0.7	2.0	2000	-0.5	0.5	27.9	2.8	11	45.4	54	16	57.6	76
20190819	12	0.5	3.2	400	0.7	0.4	28.0	3.4	11	50.3	66	17	68.9	104
20190820	11	3.7	5.3	500	-0.5	-1.4	28.1	3.2	12	59.6	72	9	64.8	69
20190821	8	1.1	2.8	300	0.0	1.2	28.1	2.8	13	49.5	59	12	63.3	84

