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Revisiting Environmental Wind and Moisture Calculations in the Context of Tropical Cyclone
Intensification

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Supporting Information for

Revisiting Environmental Wind and Moisture Computations in the Context of Tropical Cyclone Intensification

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Additional percent changes for all time series presented in the manuscript. For the entire annulus, percent change in RH in a weak (Table S1), moderate (Table S2), and strong (Table S3) shear environment. Percent change for shear-relative quadrants for all TCs in downshear right (DSR), downshear left (DSL), upshear left (USL), and upshear right (USR) (Table S4). Percent change for additional shear depths (Table S5) and relative humidity layer averages (Table S6) calculations.

Table S1: Percent change in relative humidity in a weakly sheared environment. The columns provide the radius (first column), intensification rate (second column), mean onset value (third column), percent change from 48 h prior to (fourth column), 24 h prior to (fifth column), 12 h prior to (sixth column), 12 h after (seventh column), and 24 h after (eighth column) onset of intensification.

Radius	Intensification	Onset Value (%)	-48 to 0 (%)	-24 to 0 (%)	-12 to 0 (%)	0 to 12 (%)	0 to 24 (%)
Inner	RI	78.9	0.1	0.6	0.2	-0.2	-0.7
	MI	77.3	3.7	1.9	0.5	0.8	0.5
	SI	74.2	-0.1	-0.2	-0.7	1.3	1.0
Middle	RI	64.4	-4.6	-2.9	-1.6	-1.2	-2.2
	MI	59.8	-3.7	-1.8	-0.8	-0.1	-0.7
	SI	58.2	-4.5	-2.0	-1.2	-0.6	-1.6
Standard	RI	58.4	-5.4	-3.3	-1.6	-1.8	-3.5
	MI	53.6	-5.0	-2.5	-1.1	-0.6	-1.5
	SI	52.5	-4.7	-1.9	-1.3	-1.1	-2.4

Table S2: Percent change in relative humidity in a moderately sheared environment. The columns provide the radius (first column), intensification rate (second column), mean onset value (third column), percent change from 48 h prior to (fourth column), 24 h prior to (fifth column), 12 prior to (sixth column), 12 h after (seventh column), and 24 h after (eighth column) onset of intensification.

Radius	Intensification	Onset Value (%)	-48 to 0 (%)	-24 to 0 (%)	-12 to 0 (%)	0 to 12 (%)	0 to 24 (%)
Inner	RI	77.7	3.2	1.4	1.0	0.3	0.8
	MI	75.2	2.5	1.4	0.7	0.2	0.9
	SI	72.9	-1.6	-0.2	0.8	0.3	0.6
Middle	RI	63.3	-2.9	-1.3	-0.8	-1.2	-1.7
	MI	60.0	-3.8	-2.4	-1.2	-1.0	-1.9
	SI	57.5	-5.3	-2.5	-0.7	-1.0	-1.3
Standard	RI	57.1	-4.6	-2.4	-1.6	-1.4	-2.3
	MI	54.2	-5.0	-2.8	-1.5	-1.6	-3.1
	SI	41.8	-5.4	-2.5	-0.9	-1.0	-1.7

Table S3: Percent change in relative humidity in a strongly sheared environment. The columns provide the radius (first column), intensification rate (second column), mean onset value (third column), percent change from 48 h prior to (fourth column), 24 h prior to (fifth column), 12 prior to (sixth column), 12 h after (seventh column), and 24 h after (eighth column) onset of intensification.

Radius	Intensification	Onset Value (%)	-48 to 0 (%)	-24 to 0 (%)	-12 to 0 (%)	0 to 12 (%)	0 to 24 (%)
Inner	RI	74.8	0	1.8	1.0	0.4	0.5
	MI	69.0	-3.1	-1.6	-0.6	1.2	2.4
	SI	67.3	-5.1	-1.8	-1.0	-0.1	0.4
Middle	RI	61.5	-5.1	-1.2	0	-0.5	0.1
	MI	56.1	-5.9	-3.5	-1.8	-0.2	-1.1
	SI	55.2	-6.8	-3.0	-1.9	-1.2	-2.1
Standard	RI	56.2	-5.5	-2.0	-0.7	-0.5	-0.6
	MI	50.9	-6.1	-3.6	-1.9	-0.6	-1.9
	SI	49.5	-7.0	-3.5	-2.2	-1.1	-2.3

Table S4: Percent change in relative humidity by shear-relative quadrant for all TCs. The columns provide the radius (first column), intensification rate (second column), quadrant (third column), mean onset value (fourth column), percent change from 48 h prior to (fifth column), 24 h prior to (sixth column), 12 prior to (seventh column), 12 h after (eighth column), and 24 h after (ninth column) onset of intensification.

Radius	Intensification	Quadrant	Onset Value (%)	-48 to 0 (%)	-24 to 0 (%)	-12 to 0 (%)	0 to 12 (%)	0 to 24 (%)
Inner	RI	DSR	80.0	0.6	1.3	1.8	0.3	0.5
		DSL	82.7	1.4	-0.9	-0.4	0.2	0.9
		USL	75.9	3.1	0.4	-0.4	0.3	0.2
		USR	73.9	2.7	4.5	1.8	-0.5	-1.2
	MI	DSR	77.0	2.2	1.6	0.5	0.7	0.9
		DSL	81.8	2.6	2.1	1.0	0.8	1.8
		USL	72.5	1.9	0.4	0.5	0.3	1.2
		USR	69.7	0.9	0.1	-0.1	0.5	0.1
	SI	DSR	73.6	-2.3	-0.8	0.1	0.2	-0.2
		DSL	79.7	0	0.1	0.3	0.9	1.2
		USL	68.9	-3.2	-0.4	0	0.6	1.3
		USR	63.9	-4.6	-1.9	-0.5	-0.3	0.2
Middle	RI	DSR	65.9	-5.6	-3.4	-1.0	-0.7	0.1
		DSL	68.3	-4.0	-3.7	-2.0	-2.8	-2.4
		USL	60.9	-3.0	-1.9	-2.1	-1.4	-4.1
		USR	58.9	-2.1	1.9	0.9	0.4	-0.7
	MI	DSR	62.9	-4.0	-2.6	-1.4	-1.0	-1.3
		DSL	65.3	-3.7	-2.3	-0.7	-0.5	-1.1
		USL	55.3	-4.2	-2.8	-1.3	-0.6	-2.1

		USR	53.5	-4.5	-2.1	-1.5	-0.4	-1.4
	SI	DSR	60.6	-6.0	-2.4	-0.8	-0.4	-1.8
		DSL	64.6	-3.8	-1.5	-0.9	-0.5	-0.5
		USL	51.9	-6.4	-3.3	-1.7	-1.4	-1.4
		USR	50.5	-6.9	-3.3	-1.4	-1.8	-3.2
Standard		RI	DSR	60.9	-5.2	-3.0	-1.0	-1.3
	DSL		60.6	-5.6	-4.2	-2.4	-2.8	-3.7
	USL		53.9	-6.0	-3.5	-3.1	-1.8	-5.5
	USR		54.2	-3.2	0.5	0.2	0.3	-0.4
	MI	DSR	57.8	-5.2	-3.6	-1.8	-1.1	-1.5
		DSL	57.5	-5.1	-2.8	-1.0	-1.4	-2.7
		USL	49.0	-5.4	-3.3	-1.7	-1.6	-4.2
		USR	49.5	-5.1	-1.8	-1.3	-0.5	-1.5
	SI	DSR	56.0	-5.7	-2.5	-1.1	-0.4	-2.0
		DSL	56.6	-4.3	-1.8	-1.1	-0.6	-0.6
		USL	45.5	-6.8	-4.0	-2.0	-1.8	-2.4
		USR	46.7	-6.5	-2.7	-1.3	-1.7	-3.5

Table S5: Percent change in shear for new shear depth calculations. The columns provide the new depth (first column), radius (second column), intensification rate (third column), mean onset value (fourth column), percent change from 48 h prior to (fifth column), 24 h prior to (sixth column), 12 h prior to (seventh column), 12 h after (eighth column), and 24 h after (ninth column) onset of intensification.

New Depth	Radius	Intensification	Onset Value (kt)	-48 to 0 (%)	-24 to 0 (%)	-12 to 0 (%)	0 to 12 (%)	0 to 24 (%)
925-150 hPa	Inner	RI	11.2	-13.1	-2.3	0.7	2.2	10.5
		MI	13.4	-11.2	-4.5	-1.3	-0.3	5.2
		SI	14.9	-4.7	-0.5	-1.6	1.7	3.3
	Middle	RI	11.3	-7.1	-3.1	-1.6	2.0	8.2
		MI	13.5	-8.4	-3.9	-1.3	-0.5	5.4
		SI	15/2	-1.9	0.2	-1.0	0.9	0.9
	Standard	RI	11.4	-3.5	-1.5	-2.5	2.9	8.1
		MI	13.3	-7.0	-3.2	-0.3	-0.8	5.4
		SI	14.9	0	1.0	-0.4	0.8	0.8
925-400 hPa	Inner	RI	10.9	-12.0	-7.6	-3.3	7.8	21.6
		MI	12.8	-1.2	-0.5	0.9	4.0	10.3
		SI	14.2	2.4	-0.5	-1.9	0.1	2.8
	Middle	RI	7.3	-13.1	-5.1	-1.8	9.3	21.2
		MI	9.0	-7.1	-2.4	1.2	5.0	16.6
		SI	10.6	1.6	-0.2	-2.0	1.1	4.1
	Standard	RI	6.8	-10.1	-1.3	0.6	8.7	17.0
		MI	8.1	-7.7	-2.5	0.8	5.4	18.6
		SI	9.7	3.2	1.3	-0.7	2.9	6.7

Table S6: Percent change in relative humidity for new RH layer average calculations. The columns provide the new averaged layers (first column), radius (second column), intensification rate (third column), mean onset value (fourth column), percent change from 48 h prior to (fifth column), 24 h prior to (sixth column), 12 prior to (seventh column), 12 h after (eighth column), and 24 h after (ninth column) onset of intensification.

New Layers	Radius	Intensification	Onset Value (%)	-48 to 0 (%)	-24 to 0 (%)	-12 to 0 (%)	0 to 12 (%)	0 to 24 (%)
700-850 hPa	Inner	RI	83.1	-0.4	-0.3	-0.2	-0.1	-0.8
		MI	82.7	0.1	0.1	0.1	-0.1	-0.4
		SI	82.4	-0.7	-0.3	0	-0.2	-0.6
	Middle	RI	73.5	-1.5	-1.0	-0.6	-0.7	-1.3
		MI	71.4	-2.0	-1.3	-0.7	-0.5	-1.1
		SI	70.3	-2.4	-1.1	-0.5	-0.6	-1.2
	Standard	RI	69.4	-1.3	-0.7	-0.5	-0.7	-1.5
		MI	66.7	-2.1	-1.3	-0.7	-0.4	-1.2
		SI	65.3	-2.7	-1.1	-0.5	-0.6	-1.2
600-800 hPa	Inner	RI	84.9	0.6	0.2	0.1	0	-0.7
		MI	83.0	0.5	0.4	0.3	0.3	0.1
		SI	81.3	-1.7	-0.4	0.2	-0.2	-0.2
	Middle	RI	72.1	-1.9	-1.2	-0.7	-0.8	-1.7
		MI	68.3	-3.4	-2.0	-1.0	-0.5	-1.4
		SI	66.5	-4.5	-2.1	-0.9	-0.9	-1.7
	Standard	RI	66.7	-2.3	-1.3	-0.7	-1.2	-2.5
		MI	62.5	-4.1	-2.2	-1.1	-0.7	-1.6
		SI	60.6	-4.9	-2.3	-1.1	-1.0	-2.0

400-800 hPa	Inner	RI	79.4	2.4	2.0	0.9	0.5	0.8
		MI	75.6	1.2	0.8	0.8	0.7	0.7
		SI	72.2	-3.1	-1.1	-0.2	0.6	1.3
	Middle	RI	64.4	-1.8	-0.2	0.1	-0.3	0
		MI	61.2	-3.2	-1.4	-0.6	0.3	-0.1
		SI	59.7	-4.7	-2.2	-1.0	-0.4	-0.4
	Standard	RI	58.9	-1.7	-0.6	-0.1	-0.5	-0.7
		MI	55.9	-3.2	-1.4	-0.6	0.1	-0.2
		SI	54.9	-3.9	-1.9	-0.9	-0.5	-0.7