

**Trends in Global Tropical Cyclone Activity: 1990-2020**

**P. J. Klotzbach<sup>1</sup>, K. M. Wood<sup>2\*</sup>, C. J. Schreck<sup>3</sup>, S. G. Bowen<sup>4</sup>, C. M. Patricola<sup>5</sup>, and M. M. Bell<sup>1</sup>**

<sup>1</sup>Department of Atmospheric Science, Colorado State University, Fort Collins, CO, USA.

<sup>2</sup>Department of Geosciences, Mississippi State University, Mississippi State, MS, USA.

<sup>3</sup>Cooperative Institute for Satellite Earth System Studies (CISESS), North Carolina State University, Asheville, NC, USA.

<sup>4</sup>Aon, Chicago, IL, USA.

<sup>5</sup>Department of Geological and Atmospheric Sciences, Iowa State University, Ames, IA, USA.

\*Klotzbach and Wood contributed equally to this work

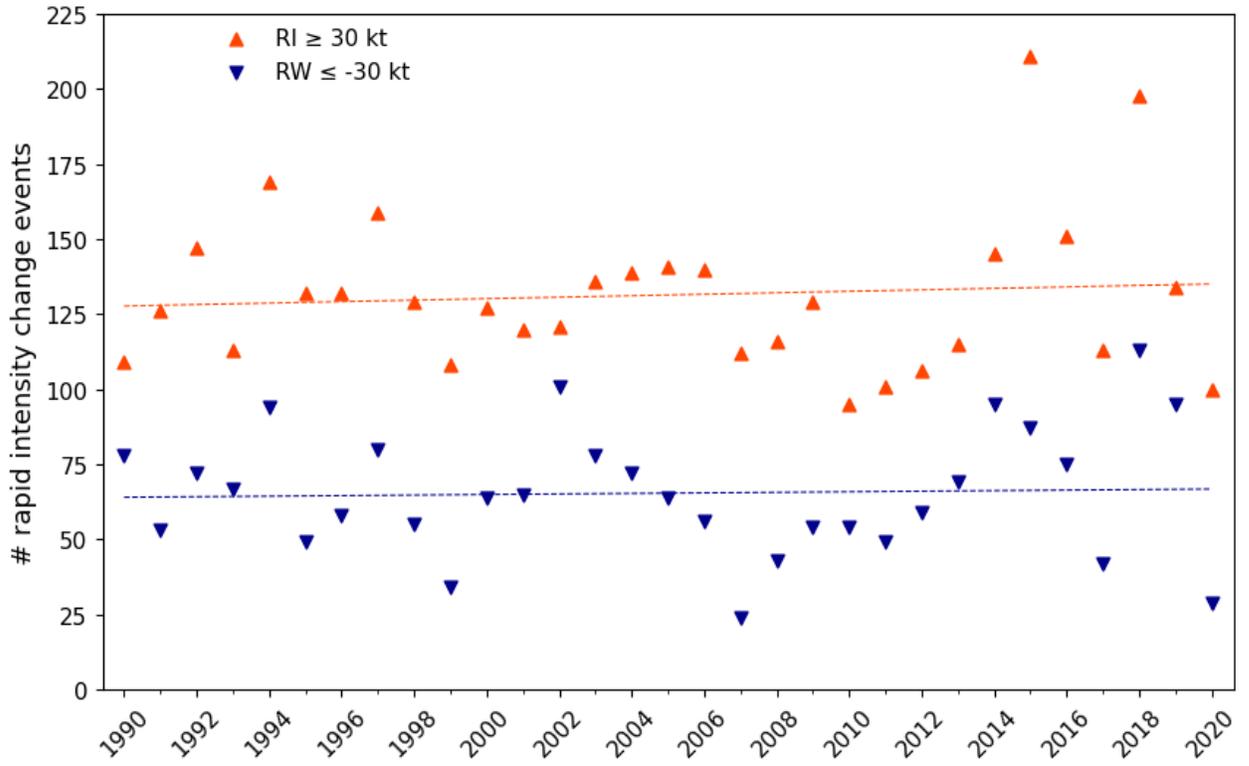
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**Introduction**

This supporting information includes one additional figure and two additional tables. Figure S1 displays global rapid intensity change events at a 30-kt threshold from 1990-2020. Table S1 displays average values of various TC indices from 1990-2020. Table S2 displays linear per-decade trends in these TC indices from 1990-2020.



**Figure S1.** Global rapid intensity change events for the 30-kt RI and -30-kt RW thresholds.

**Table S1.** Average annual values for several TC metrics globally and for six individual TC basins during 1990-2020. The percentage of global TC activity generated in each basin is listed in parentheses.

| TC Metric                              | Globe | North Atlantic | Eastern North Pacific | Western North Pacific | North Indian | South Indian | South Pacific |
|--|-------|----------------|-----------------------|-----------------------|--------------|--------------|---------------|
| Named Storms                           | 87.1  | 14.4 (17%)     | 16.7 (19%)            | 25.6 (29%)            | 5.2 (6%)     | 15.8 (18%)   | 9.3 (11%)     |
| Named Storms <=2 Days                  | 21.0  | 3.8 (18%)      | 4.2 (20%)             | 4.9 (23%)             | 2.1 (10%)    | 3.4 (16%)    | 2.7 (13%)     |
| Named Storms >2 Days                   | 66.0  | 10.6 (16%)     | 12.6 (19%)            | 20.7 (31%)            | 3.1 (5%)     | 12.4 (19%)   | 6.6 (10%)     |
| Named Storm Days                       | 409.9 | 69.4 (17%)     | 74.5 (18%)            | 134.4 (33%)           | 16.5 (4%)    | 76.3 (18%)   | 38.6 (11%)    |
| Hurricanes                             | 47.9  | 7.2 (15%)      | 9.1 (19%)             | 16.1 (34%)            | 2.1 (4%)     | 8.8 (18%)    | 4.6 (10%)     |
| Hurricane Days                         | 169.6 | 27.0 (15%)     | 29.4 (19%)            | 65.6 (34%)            | 4.3 (3%)     | 28.6 (17%)   | 14.7 (9%)     |
| Major Hurricanes                       | 25.3  | 3.1 (12%)      | 4.7 (18%)             | 9.2 (36%)             | 1.0 (4%)     | 4.9 (19%)    | 2.4 (10%)     |
| Major Hurricane Days                   | 58.0  | 7.2 (12%)      | 9.8 (17%)             | 24.9 (43%)            | 1.5 (3%)     | 9.8 (17%)    | 4.8 (8%)      |
| Cat. 4-5 Hurricanes                    | 18.3  | 1.9 (11%)      | 3.3 (18%)             | 7.5 (41%)             | 0.7 (4%)     | 3.3 (18%)    | 1.6 (9%)      |
| Cat. 4-5 Hurricane %                   | 38%   | 27%            | 37%                   | 47%                   | 32%          | 37%          | 34%           |
| Cat. 4-5 Days                          | 32.3  | 3.9 (12%)      | 4.7 (15%)             | 15.7 (49%)            | 0.8 (3%)     | 4.8 (15%)    | 2.4 (7%)      |
| ACE (10 <sup>4</sup> kt <sup>2</sup> ) | 789   | 122 (15%)      | 137 (17%)             | 302 (38%)             | 24 (3%)      | 135 (17%)    | 70 (9%)       |
| 30-kt RI Events                        | 131.4 | 15.9 (12%)     | 24.9 (19%)            | 48.6 (37%)            | 4.7 (4%)     | 24.3 (18%)   | 13.1 (10%)    |
| 50-kt RI Events                        | 26.5  | 2.4 (9%)       | 5.5 (21%)             | 10.1 (38%)            | 1.0 (4%)     | 4.9 (18%)    | 2.6 (10%)     |
| 30-kt RW Events                        | 65.4  | 3.7 (6%)       | 19.5 (30%)            | 16.6 (25%)            | 0.9 (1%)     | 16.9 (26%)   | 7.8 (12%)     |
| 50-kt RW Events                        | 7.5   | 0.3 (4%)       | 2.0 (27%)             | 1.8 (24%)             | 0.1 (1%)     | 2.3 (31%)    | 1.1 (15%)     |
| Damage (Billions USD)                  | 99.3  | 61.2 (62%)     | 1.0 (1%)              | 30.4 (31%)            | 5.4 (5%)     | 0.4 (<1%)    | 0.7 (1%)      |

**Table S2.** As in Table S1 but for per-decade linear trends. Category 4-5 hurricane percentage linear trends are not displayed for the North Indian Ocean due to limited per-year hurricane formations. Trends significant at the 5% level are highlighted in bold-face, while trends significant at the 10% level are italicized.

| TC Metric             | Globe        | North Atlantic | Eastern North Pacific | Western North Pacific | North Indian | South Indian | South Pacific |
|-----------------------|--------------|----------------|-----------------------|-----------------------|--------------|--------------|---------------|
| Named Storms          | 1.0          | <b>2.7</b>     | 1.1                   | <b>-1.8</b>           | 0.3          | -0.8         | -0.5          |
| Named Storms <=2 Days | <b>3.0</b>   | <b>1.0</b>     | <b>1.3</b>            | 0.4                   | 0.1          | -0.2         | 0.4           |
| Named Storms >2 Days  | -2.0         | <b>1.8</b>     | -0.2                  | <b>-2.3</b>           | 0.2          | -0.6         | -1.0          |
| Named Storm Days      | -27.3        | 9.2            | -1.2                  | <b>-22.2</b>          | 1.4          | <b>-9.4</b>  | -5.0          |
| Hurricanes            | -2.1         | 0.7            | -0.2                  | <b>-2.0</b>           | 0.4          | -0.3         | -0.5          |
| Hurricane Days        | <b>-20.3</b> | 0.7            | -3.5                  | <b>-12.6</b>          | <b>1.5</b>   | <b>-4.4</b>  | -2.1          |
| Major Hurricanes      | 0.3          | 0.5            | 0.0                   | -0.2                  | 0.3          | -0.2         | -0.1          |
| Major Hurricane Days  | -4.8         | 1.2            | -1.1                  | -3.9                  | 0.5          | -1.0         | -0.4          |
| Cat. 4-5 Hurricanes   | 0.7          | 0.5            | 0.2                   | -0.1                  | 0.1          | 0.0          | 0.0           |
| Cat. 4-5 Hurricane %  | 3%           | 5%             | 3%                    | 4%                    | ---          | 2%           | 4%            |
| Cat. 4-5 Days         | -2.5         | 0.7            | -0.7                  | -2.2                  | 0.3          | -0.6         | 0.0           |
| ACE                   | -66          | 14             | -10                   | <b>-50</b>            | 5            | -18          | -8            |
| 30-kt RI Events       | 2.5          | 4.0            | 0.8                   | -1.8                  | 0.8          | -0.8         | -0.5          |
| 50-kt RI Events       | <b>5.8</b>   | 0.6            | 0.9                   | 2.1                   | <b>0.7</b>   | 1.4          | 0.1           |
| 30-kt RW Events       | 0.9          | 0.8            | 0.0                   | -1.1                  | <b>1.1</b>   | 0.4          | -0.4          |
| 50-kt RW Events       | 1.1          | 0.1            | 0.3                   | -0.2                  | 0.2          | 0.9          | -0.2          |
| Damage (Billions USD) | <b>43.7</b>  | 31.0           | 0.0                   | <b>7.5</b>            | <b>4.5</b>   | 0.4          | <b>0.4</b>    |