**Table 1 Trends In Annual Frequency of Natech Events**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Hazard | Value a | Entire US | Other | Ohio Valley  | Upper Midwest  | North East | North West | South | South East | South West | West | N. Rockies & Plains |
| Cold | Average  | **61** | 8 | **10** | 4 | 10 | 2 | 12 | 5 | 3 | 2 | 3 |
| Change | **-1.3** | -0.4 | **-0.3** | 0.0 | -0.2 | 0.0 | 0.0 | -0.1 | 0.0 | -0.2 | 0.0 |
| Confidence | **95.1** | 77.70 | **92.00** | 61.80 | 84.40 | 49.30 | 60.50 | 59.10 | 64.50 | 89.00 | 79.20 |
| Earthquake | Average  | **5** | 0.4 | 0.2 | 0.0 | 0.1 | 0.2 | 0.5 | 0.0 | 0.1 | 2.8 | 0.1 |
| Change | **-0.2** | 0.0 | -0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | -0.01 | -0.22 | -0.01 |
| Confidence | **93.3** | 80.2 | 70.20 | - | 59.80 | 50.00 | 54.90 | 58.40 | 65.80 | 84.00 | 63.80 |
| Flood | Average  | **68** | 1.1 | 13.4 | 2.7 | 12.8 | 1.9 | **20.6** | **6.5** | 3.1 | 3.1 | 2.5 |
| Change | **1.4** | 0.03 | 0.1 | 0.05 | 0.2 | 0.01 | **0.9** | **0.01** | 0.1 | -0.1 | 0.1 |
| Confidence | **99.20** | 88.60 | 73.20 | 73.80 | 70.80 | 73.20 | **92.60** | **92.30** | 50.70 | 54.20 | 78.70 |
| Heat | Average  | 6 | 0.7 | **0.7** | 0.3 | 1.6 | 0.3 | **1.1** | **1.0** | 0.1 | 0.7 | 0.2 |
| Change | -0.07 | -0.02 | **-0.02** | 0.03 | 0.01 | 0.0 | **-0.1** | **-0.03** | -0.01 | 0.01 | -0.004 |
| Confidence | 65.80 | 55.40 | **91.50** | 84.50 | 56.10 | 65.70 | **>99.9** | **96.40** | 86.80 | 52.00 | 81.00 |
| Hurricane | Average  | **174** | 0.1 | **1.5** | 0.0 | **28.6** | 0.0 | **107.2** | **28.4** | 0.3 | 0.0 | 0.0 |
| Change | **9.1** | 0.0 | **0.1** | 0.0 | **2.3** | 0.0 | **4.1** | **2.3** | 0.0 | 0.0 | 0.0 |
| Confidence | **99.50** | 87.2 | **90.0** | 49.3 | **91.2** | 49.3 | **98.6** | **95.70** | 54.2 | 54.2 | - |
| Landslide | Average  | **6** | 0.17 | 1.14 | **0.24** | 0.38 | 0.55 | 0.34 | 0.45 | 0.34 | 1.86 | 0.24 |
| Change | **-0.18** | -0.01 | -0.04 | **-0.03** | -0.01 | -0.02 | -0.01 | 0.02 | -0.02 | -0.06 | 0.00 |
| Confidence | **94.90** | 86.40 | 87.90 | **95.30** | 67.70 | 69.60 | 68.40 | 77.20 | 73.20 | 61.10 | 73.80 |
| Lightning | Average  | **60** | 0.1 | **9** | **5** | **8** | 1 | 24 | **8** | 2 | 3 | **1** |
| Change | **-0.9** | -0.01 | **-0.2** | **0.1** | **-0.2** | 0.0 | -0.1 | **-0.3** | 0.01 | -0.01 | **-0.1** |
| Confidence | **99.80** | 71.40 | **99.70** | **93.10** | **99.50** | 81.20 | 70.80 | **>99.9** | 63.20 | 52.10 | **95.90** |
| Rain | Average  | 220 | 10 | **27** | 6 | 30 | **8** | **93** | 26 | 4 | **13** | 3 |
| Change | -1.7 | 0.2 | **-0.3** | 0.1 | 0.2 | **0.2** | **-1.7** | -0.1 | -0.1 | **-0.2** | -0.1 |
| Confidence | 71.40 | 84.40 | **96.20** | 74.90 | 61.80 | **99.10** | **98.30** | 69.60 | 59.10 | **93.10** | 89.70 |
| Storm / Weather / Unknown | Average  | **156** | **5** | **21** | 7 | **27** | 4 | **54** | 19 | 5 | 11 | 3 |
| Change | **2.5** | **0.27** | **0.49** | 0.08 | **0.60** | 0.07 | **0.39** | 0.16 | 0.04 | 0.12 | 0.04 |
| Confidence | **>99.9** | **>99.9** | **99.70** | 87.90 | **99.60** | 84.00 | **95.90** | 71.40 | 74.40 | 81.20 | 75.50 |
| Tide | Average  | **8** | 0.50 | 0.03 | 0.03 | 1.63 | 0.77 | **2.73** | 1.43 | 0.00 | 0.93 | 0.00 |
| Change | **-0.2** | -0.01 | 0.00 | 0.00 | -0.03 | 0.02 | **-0.16** | 0.00 | 0.00 | -0.03 | 0.00 |
| Confidence | **99.50** | 59.80 | 55.60 | 55.60 | 86.40 | 76.10 | **99.60** | 57.00 | 49.30 | 82.70 | 49.30 |
| Tornado | Average  | **17** | 0.1 | 3.4 | 1.1 | 0.9 | 0.0 | **7.0** | 3.3 | 0.2 | 0.0 | 0.8 |
| Change | **0.3** | 0.00 | 0.06 | 0.01 | 0.05 | 0.00 | **0.17** | 0.05 | -0.02 | 0.01 | -0.01 |
| Confidence | **98.40** | 60.50 | 83.10 | 52.10 | 81.20 | 49.30 | **99.30** | 54.20 | 84.00 | 66.40 | 65.80 |
| Wildfire | Average  | **1** | 0.000 | 0.133 | 0.000 | 0.033 | 0.067 | 0.067 | 0.000 | 0.033 | **0.167** | 0.000 |
| Change | **0.1** | 0.000 | 0.005 | 0.000 | 0.003 | 0.006 | 0.008 | 0.000 | 0.003 | **0.028** | 0.000 |
| Confidence | **98.700** | 49.30 | 65.80 | 49.30 | 58.40 | 67.10 | 74.40 | 49.30 | 59.80 | **90.60** | - |
| Wind | Average  | **96** | **2** | **13** | 4 | **30** | **5** | 18 | **11** | 1 | **9** | 2 |
| Change | **3.1** | **0.08** | **0.42** | 0.06 | **1.50** | **0.23** | 0.12 | **0.42** | 0.02 | **0.22** | 0.00 |
| Confidence | **>99.9** | **99.40** | **>99.9** | 78.20 | **>99.9** | **99.80** | 65.10 | **>99.9** | 73.80 | **96.30** | 68.40 |
| All | Average  | **875** | **31** | 100 | 30 | **152** | **24** | 341 | **115** | 19 | 47 | 15 |
| Change | **11.8** | **0.4** | 0.4 | 0.3 | **4.3** | **0.5** | 3.6 | **2.4** | 0.1 | -0.4 | 0.0 |
| Confidence | **>99.9** | **98.40** | 69 | 88 | **99.50** | **98.70** | 85.6 | **92.8** | 50.7 | 81.2 | 74.4 |
| a Units of natech event per year |  |  |  |  |  |  |  |  |  |  |
| **Bold Confidence Level > 90** |  |  |  |  |  |  |  |  |  |  |
| **Shaded Confidence Level >95** |  |  |  |  |  |  |  |  |  |  |

**Table 2 Correlation of Natech Events to Storm Database**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Hazard | Value | Entire US | Other | Ohio Valley  | Upper Midwest  | North East | North West | South | South East | South West | West | N. Rockies & Plains |
| Cold | r | **0.37** | 0.28 | **0.54** | **0.41** | -0.14 | -0.27 | **0.50** | **0.39** | **0.38** | -0.06 | 0.04 |
| p | **0.07** | 0.19 | **0.01** | **0.04** | 0.51 | 0.20 | **0.01** | **0.06** | **0.07** | 0.78 | 0.87 |
| Earthquake | r | NA |
| p |
| Flood | r | **0.40** | -0.12 | **0.40** | **0.59** | **0.52** | 0.30 | **0.77** | **0.43** | **0.75** | 0.17 | **0.84** |
| p | **0.05** | 0.58 | **0.05** | **0.00** | **0.01** | 0.16 | **0.00** | **0.04** | **0.00** | 0.43 | **0.00** |
| Heat | r | 0.33 | **0.81** | 0.21 | 0.26 | 0.28 | **0.44** | 0.10 | -0.06 | -0.08 | -0.15 | -0.13 |
| p | 0.11 | **0.00** | 0.32 | 0.23 | 0.19 | **0.03** | 0.66 | 0.77 | 0.71 | 0.49 | 0.53 |
| Hurricane | r | **0.64** | 0.01 | -0.09 | - | 0.18 | - | **0.73** | **0.61** | -0.05 | 0.10 | - |
| p | **0.00** | 0.95 | 0.69 | - | 0.41 | - | **0.00** | **0.00** | 0.82 | 0.63 | - |
| Landslide | r | NA |
| p |
| Lightning | r | **0.64** | -0.02 | **0.63** | **-0.47** | **0.47** | -0.05 | 0.15 | **0.53** | 0.06 | 0.31 | 0.27 |
| p | **0.00** | 0.92 | **0.00** | **0.02** | **0.02** | 0.81 | 0.48 | **0.01** | 0.80 | 0.14 | 0.21 |
| Rain | r | -0.03 | 0.27 | -0.07 | 0.32 | 0.09 | 0.02 | -0.09 | 0.23 | 0.27 | 0.05 | 0.14 |
| p | 0.91 | 0.21 | 0.76 | 0.13 | 0.69 | 0.93 | 0.66 | 0.28 | 0.21 | 0.83 | 0.50 |
| Storm / Weather / Unknown | r | 0.18 | **0.58** | 0.33 | 0.18 | **0.41** | 0.26 | 0.22 | 0.24 | 0.21 | 0.03 | 0.02 |
| p | 0.40 | **0.00** | 0.12 | 0.39 | **0.05** | 0.23 | 0.29 | 0.25 | 0.32 | 0.90 | 0.92 |
| Tide | r | NA |
| p |
| Tornado | r | **0.58** | 0.30 | **0.75** | 0.32 | **0.64** | - | **0.45** | **0.64** | **0.59** | -0.17 | 0.11 |
| p | **0.00** | 0.16 | **0.00** | 0.13 | **0.00** | - | **0.03** | **0.00** | **0.00** | 0.42 | 0.60 |
| Wildfire | r | **0.50** | - | 0.07 | - | -0.02 | 0.01 | **0.71** | - | 0.29 | -0.05 | - |
| p | **0.01** | - | 0.75 | - | 0.93 | 0.97 | **0.00** | - | 0.17 | 0.81 | - |
| Wind | r | **0.63** | **-0.40** | **0.61** | **0.54** | **0.44** | **0.76** | -0.18 | **0.38** | -0.05 | 0.27 | -0.11 |
| p | **0.00** | **0.05** | **0.00** | **0.01** | **0.03** | **0.00** | 0.40 | **0.06** | 0.81 | 0.20 | 0.62 |
| **Bold p<0.1** |  |  |  |  |  |  |  |  |  |  |  |
| **Shaded p<0.05** |  |  |  |  |  |  |  |  |  |  |  |

**Table 3 Correlation of Natech Events with Climate Extreme Index**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Natech Cause - CEI Factor | Value | Entire US | Ohio Valley  | Upper Midwest  | North East | North West | South | South East | South West | West | N. Rockies & Plains |
| Cold – Min T | r | 0.19 | 0.24 | 0.22 | 0.04 | -0.01 | **0.35** | 0.16 | 0.01 | 0.29 | 0.13 |
| p | 0.30 | 0.20 | 0.25 | 0.85 | 0.96 | **0.06** | 0.39 | 0.96 | 0.12 | 0.50 |
| Earthquake | NA |
| Flood - Extreme Precip. | r | **0.45** | 0.20 | **0.33** | **0.61** | **0.63** | **0.50** | 0.04 | 0.01 | 0.23 | 0.05 |
| p | **0.01** | 0.28 | **0.07** | **0.00** | **0.00** | **0.00** | 0.84 | 0.98 | 0.23 | 0.80 |
| Heat - Warm T | r | 0.19 | **0.45** | 0.11 | 0.18 | -0.19 | -0.09 | -0.06 | -0.13 | -0.06 | **0.41** |
| p | 0.31 | **0.01** | 0.55 | 0.35 | 0.32 | 0.65 | 0.77 | 0.51 | 0.77 | **0.02** |
| Hurricane - TSSa | r | **0.46** | NA |
| p | **0.01** |
| Landslide - Extreme Precip. | r | 0.26 | 0.16 | -0.10 | 0.02 | 0.14 | 0.23 | -0.18 | -0.11 | -0.01 | 0.18 |
| p | 0.16 | 0.39 | 0.59 | 0.91 | 0.47 | 0.22 | 0.35 | 0.57 | 0.94 | 0.34 |
| Lightning - Extreme Precip. | r | -0.14 | 0.02 | 0.13 | -0.20 | 0.18 | -0.25 | 0.27 | -0.05 | -0.29 | -0.19 |
| p | 0.45 | 0.93 | 0.48 | 0.28 | 0.35 | 0.19 | 0.15 | 0.79 | 0.12 | 0.32 |
| Rain-Extreme Precip. | r | -0.12 | 0.15 | 0.10 | **0.41** | -0.26 | 0.01 | **0.40** | 0.20 | -0.14 | 0.14 |
| p | 0.54 | 0.42 | 0.60 | **0.03** | 0.17 | 0.97 | **0.03** | 0.29 | 0.47 | 0.45 |
| Rain-Wet Days | r | 0.21 | 0.25 | **0.45** | **0.32** | 0.19 | 0.26 | **0.35** | 0.04 | 0.13 | **0.47** |
| p | 0.28 | 0.18 | **0.01** | **0.08** | 0.33 | 0.17 | **0.06** | 0.83 | 0.49 | **0.01** |
| Storm/Weather- Extreme Precip. | r | 0.12 | 0.34 | 0.07 | **0.51** | 0.27 | -0.15 | -0.06 | -0.11 | 0.30 | -0.10 |
| p | 0.54 | 0.06 | 0.72 | **0.00** | 0.14 | 0.43 | 0.74 | 0.56 | 0.11 | 0.60 |
| Tide | NA |
| Tornado - Extreme Precip. | r | **0.36** | **0.38** | **0.31** | **0.46** | - | 0.24 | 0.08 | -0.05 | **0.52** | 0.10 |
| p | **0.05** | **0.04** | **0.09** | **0.01** | - | 0.20 | 0.67 | 0.79 | **0.00** | 0.61 |
| Wildfire - Warm T | r | **0.56** | 0.11 | -- | 0.01 | -0.01 | **0.39** | -- | **0.44** | **0.43** | -- |
| p | **0.00** | 0.58 | -- | 0.97 | 0.95 | **0.03** | -- | **0.02** | **0.02** | -- |
| Wildfire - Dry Days | r | 0.18 | 0.05 | -- | -0.14 | 0.06 | 0.34 | -- | **0.58** | -0.15 | -- |
| p | 0.34 | 0.79 | -- | 0.45 | 0.74 | 0.07 | -- | **0.00** | 0.44 | -- |
| Wind - Extreme Precip. | r | **0.41** | 0.27 | 0.07 | **0.34** | **0.33** | 0.23 | 0.08 | -0.09 | -0.01 | 0.07 |
| p | **0.02** | 0.15 | 0.73 | **0.07** | **0.07** | 0.23 | 0.67 | 0.65 | 0.94 | 0.69 |
| a TSS CEI Only Computed Nationally |  |  |  |  |  |  |  |  |
| **Bold p<0.1** |  |  |  |  |  |  |  |  |  |  |  |
| **Shaded p<0.05** |  |  |  |  |  |  |  |  |  |  |  |