

Correction

EARTH, ATMOSPHERIC, AND PLANETARY SCIENCES

Correction for “Global increase in major tropical cyclone exceedance probability over the past four decades,” by James P. Kossin, Kenneth R. Knapp, Timothy L. Olander, and Christopher S. Velden, which was first published May 18, 2020; 10.1073/pnas.1920849117 (*Proc. Natl. Acad. Sci. U.S.A.* **117**, 11975–11980).

The authors note, “We have become aware of an error in some of our calculations of exceedance probability and these errors affect some of the numbers published in Table 1 of the manuscript. We were first alerted to this by a reader of the paper. None of the errors alter any of the key results or messages of the manuscript. None of the numbers or statistics related to any of the time series analyses are affected and these remain unchanged. Specifically, some of our threshold values were inadvertently shifted in our code, and this affected the calculation of exceedance probability. The error affects the numbers shown in Table 1.

“The error also affects some of the numbers stated within the article text:

“On page 11975, the text in the Abstract that states ‘Between the early and latter halves of the time period, the major TC exceedance probability increases by about 8% per decade, with a 95% CI of 2 to 15% per decade’ should instead read ‘Between the early and latter halves of the time period, the major TC exceedance probability increases by about 5% per decade, with a 95% CI of about 0.4 to 11% per decade.’

“On page 11976, right column, second full paragraph, the text that reads ‘The probability of major hurricane exceedance increases from 0.27 to 0.31, which represents about a 15% increase.

The centroids of the early and latter subperiods are around 1988 and 2007, respectively, with a separation of about 19 y. This represents an increase in probability of major hurricane intensity of about 8% per decade’ should instead read ‘The probability of major hurricane exceedance increases from 0.3399 to 0.3725, which represents about a 10% increase. The centroids of the early and latter subperiods are around 1988 and 2007, respectively, with a separation of about 19 y. This represents an increase in probability of major hurricane intensity of about 5% per decade.’

“On page 11976, right column, second full paragraph, the text that states ‘The CIs for the early and latter halves are [0.25 0.28] and [0.29 0.32], respectively. The range of exceedance probability increases within these 95% CIs is then about 2 to 15% per decade’ should instead read ‘The CIs for the early and latter halves are [0.32 0.36] and [0.36 0.39], respectively. The range of exceedance probability increases within these 95% CIs is then about 0.4 to 11% per decade.’

“On page 11976, right column, fourth paragraph, the text that states ‘For comparison, the change in best-track intensities over the same period is roughly 17% per decade. . . or about twice the increase in major hurricane intensity exceedance found in the homogenized ADT-HURSAT data’ should instead read ‘For comparison, the change in best-track intensities over the same period is roughly 10% per decade. . . or about twice the increase in major hurricane intensity exceedance found in the homogenized ADT-HURSAT data.’

“Table 1 and its legend have been updated and appear below.”

Table 1. Differences in major hurricane intensity exceedance probability (P_{maj}) between the early and later halves of the period of analysis

	ADT-HURSAT							
	Global	NA	EP	WP	NI	SI	SP	Best-track global
Early (1979–1997)	$P_{\text{maj}} = 0.3399$ CI=[0.3243,0.3555]	$P_{\text{maj}} = 0.2306$ CI=[0.1829,0.2783]	$P_{\text{maj}} = 0.3145$ CI=[0.2851,0.3438]	$P_{\text{maj}} = 0.4341$ CI=[0.4067,0.4615]	$P_{\text{maj}} = 0.1841$ CI=[0.1039,0.2643]	$P_{\text{maj}} = 0.2750$ CI=[0.2362,0.3138]	$P_{\text{maj}} = 0.3068$ CI=[0.2627,0.3509]	$P_{\text{maj}} = 0.2895$ CI=[0.2767,0.3023]
	$N_{\text{tot}} = 9420$	$N_{\text{tot}} = 798$	$N_{\text{tot}} = 2560$	$N_{\text{tot}} = 3345$	$N_{\text{tot}} = 239$	$N_{\text{tot}} = 1360$	$N_{\text{tot}} = 1118$	$N_{\text{tot}} = 12855$
	$N_{\text{maj}} = 3202$	$N_{\text{maj}} = 184$	$N_{\text{maj}} = 805$	$N_{\text{maj}} = 1452$	$N_{\text{maj}} = 44$	$N_{\text{maj}} = 374$	$N_{\text{maj}} = 343$	$N_{\text{maj}} = 3722$
Late (1998–2017)	$P_{\text{maj}} = 0.3725$ CI=[0.3559,0.3891]	$P_{\text{maj}} = 0.3965$ CI=[0.3568,0.4363]	$P_{\text{maj}} = 0.3309$ CI=[0.2967,0.3651]	$P_{\text{maj}} = 0.4129$ CI=[0.3839,0.4419]	$P_{\text{maj}} = 0.1911$ CI=[0.1072,0.2750]	$P_{\text{maj}} = 0.3543$ CI=[0.3114,0.3973]	$P_{\text{maj}} = 0.3577$ CI=[0.3018,0.4137]	$P_{\text{maj}} = 0.3461$ CI=[0.3330,0.3591]
	$N_{\text{tot}} = 9275$	$N_{\text{tot}} = 1551$	$N_{\text{tot}} = 1940$	$N_{\text{tot}} = 2962$	$N_{\text{tot}} = 225$	$N_{\text{tot}} = 1270$	$N_{\text{tot}} = 752$	$N_{\text{tot}} = 13567$
	$N_{\text{maj}} = 2842$	$N_{\text{maj}} = 615$	$N_{\text{maj}} = 642$	$N_{\text{maj}} = 1223$	$N_{\text{maj}} = 43$	$N_{\text{maj}} = 450$	$N_{\text{maj}} = 269$	$N_{\text{maj}} = 4695$
Change	+5% decade ⁻¹	+38% decade ⁻¹	+3% decade ⁻¹	-3% decade ⁻¹	+2% decade ⁻¹	+15% decade ⁻¹	+9% decade ⁻¹	+10% decade ⁻¹
Sig.lev.	95%	99%	n/s	n/s	n/s	90%	n/s	99%
Triad time series	+6% decade ⁻¹ $P = 0.02$	+42% decade ⁻¹ $P = 0.02$	+7% decade ⁻¹ $P = 0.25$	+2% decade ⁻¹ $P = 0.58$	-15% decade ⁻¹ $P = 0.71$	+31% decade ⁻¹ $P = 0.004$	+8% decade ⁻¹ $P = 0.13$	

CI is the pointwise 95% confidence interval on P_{maj} . The significance level (Sig. lev.) of the difference is also shown (n/s = not significant at the 90% level or higher). N_{tot} and N_{maj} are the total number of hurricane and major hurricane estimates, respectively, in each period. The bottom row shows the Theil–Sen trend amplitudes and Mann–Kendall significance levels (P values) for the triad time series shown in Figs. 2 and 3 of the manuscript.

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