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Influence of global warming on western North Pacific tropical cyclone intensities during 2015

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The climate of 2015 was characterized by a strong El Niño, global warmth, and record-setting tropical cyclone (TC) intensity for western North Pacific typhoons. In this study, the highest TC intensity in 32 years (1984–2015) is shown to be a consequence of above normal TC activity—following natural internal variation—and greater efficiency of intensity. The efficiency of intensity (EINT) is termed the 'blasting' effect and refers to typhoon intensification at the expense of occurrence. Statistical models show that the EINT is mostly due to the anomalous warmth in the environment as indicated by global mean sea-surface temperature. In comparison, the EINT due to El Niño is negligible. This implies that the record-setting intensity of 2015 might not have occurred without environmental warming and suggests that a year with even greater TC intensity is possible in the near future when above normal activity coincides with another record EINT due to continuous warming.