



Tropical cyclone activity affected by volcanically induced ITCZ shifts

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Volcanic eruptions can affect global climate through changes in atmospheric and ocean circulation, and therefore could impact tropical cyclone (TC) activity. Here, we use a set of ensemble simulations performed with an Earth System Model to investigate the response of the large-scale environmental factors – that affect TCs – to strong volcanic eruptions occurring in the tropical Northern (NH) and Southern (SH) Hemisphere. Our results show that such eruptions cause a strong asymmetrical hemispheric cooling (either in the NH or SH), which shifts the Intertropical Convergence Zone (ITCZ) equatorward. The ITCZ shift and the associated surface temperature anomalies are then able to affect genesis potential indices and TC potential intensity. The effect of the volcanic eruptions on the ITCZ and hence on TC activity lasts for at least 4 years. Finally, our analysis suggests that volcanic eruptions do not lead to an overall global reduction in TC activity but rather a reorganization following the ITCZ movement. On the other hand, the volcanically induced changes in ENSO or direct sea surface temperature do not seem to have a significant impact on TC activity as previously suggested.