Geophysical Research Abstracts
Vol. 20, EGU2018-18491, 2018
EGU General Assembly 2018

Concurrent cyclones, fronts and thunderstorms and their associated hazards

Jennifer Catto (1) and Andrew Dowdy (2)

(1) College of Engineering, Mathematics and Physical Sciences, University of Exeter, Exeter, UK (j.catto@exeter.ac.uk), (2) Bureau of Meteorology, Melbourne, Australia (andrew.dowdy@bom.gov.au)

Phenomena such as cyclones, fronts and thunderstorms are known to cause extreme weather in various regions throughout the world. We have systematically examined how these phenomena combine to produce hazards such as extreme precipitation, winds and wave heights. The results presented here are intended to lead to better preparedness for the impacts of extreme weather throughout the world including in relation to disaster risk reduction.

Here we have applied objective cyclone and front identification methods to reanalysis data, and used a global dataset of lightning strikes, to examine different combinations of cyclone, front and thunderstorm events and to provide a comprehensive climatological examination of observed extreme precipitation, wind and wave events globally. This method allows a number of novel concepts to be explored, with results showing that the highest risk of extremes occurs for a type of “triple storm” event characterised by the simultaneous occurrence of a cyclone, front and thunderstorm. The importance of these phenomena and their combinations for producing joint hazards (e.g., extreme wind and rain) has been examined, as well as the influence of large-scale climate variability on their occurrence.