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TITLE: Tropical cyclones and climate change

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ABSTRACT:

Recent research has strengthened the understanding of the links between climate and tropical cyclones (TCs) on various timescales. Geological records of past climates have shown century-long variations in TC numbers. While no significant trends have been identified in the Atlantic since the late 19th century, significant observed trends in TC numbers and intensities have occurred in this basin over the past few decades, and trends in other basins are increasingly being identified. However, understanding of the causes of these trends is incomplete, and confidence in these trends continues to be hampered by a lack of consistent observations in some basins. A theoretical basis for maximum TC intensity appears now to be well established, but a climate theory of TC formation remains elusive. Climate models mostly continue to predict future decreases in global TC numbers, projected increases in the intensities of the strongest storms and increased rainfall rates. Sea level rise will likely contribute toward increased storm surge risk. Against the background of global climate change and sea level rise, it is important to carry out quantitative assessments on the potential risk of TC-induced storm surge and flooding to densely populated cities and river deltas. Several climate models are now able to generate a good distribution of both TC numbers and intensities in the current climate. Inconsistent TC projection results emerge from modeling studies due to different downscaling methodologies and warming scenarios, inconsistencies in projected changes of large-scale conditions, and differences in model physics and tracking algorithms. WIREs Clim Change 2016, 7:65-89. doi: 10.1002/wcc.371 This article is categorized under: Paleoclimates and Current Trends > Earth System Behavior

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