



## **Extra-tropical Cyclones in a Warmer Climate**

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The nature of likely changes in extra-tropical cyclones in a warmer climate is an important question as these storms can result in damaging winds and flooding such as from the storm surge. They are also beneficial as they bring the majority of the precipitation required to sustain life. Hence, any changes in these storms, in terms of location or intensity as the climate warms, needs to be determined for adaptation to the likely changes. In this talk results from modern General Circulation Model (GCM) simulations of the current and future climate at both standard climate resolutions and in new high resolution simulations will be discussed in terms of changes in extra-tropical cyclones. The cyclones in the models will first be compared with those in re-analyses to assess the fidelity of the models to simulate these storms. This will show that at the higher resolutions a modern GCM is capable of simulating the cyclones remarkably well including their intensities and the fine detail of their structure. The impact of a future warmer climate on the location and intensities of the storms will then be discussed with a particular focus on their intensities for a range of variables. Possible deficiencies in the models that may affect what we see in terms of cyclone properties in a warmer climate will also be discussed. If time permits some comments on tropical cyclones in a warmer world will also be presented.