Center for Sustainability Science and Strategy

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How do winter-time extratropical cyclones change in the future over South Africa?

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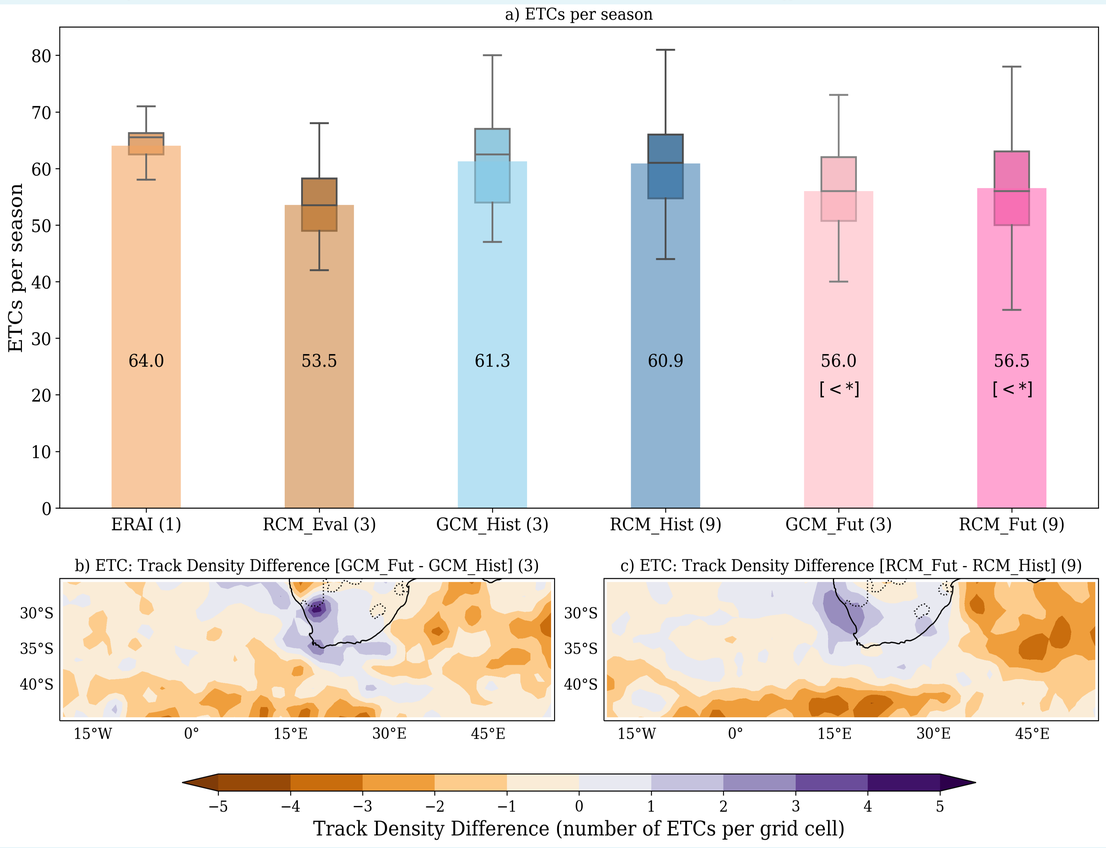
Extra-tropical Cyclones (ETCs) over South Africa

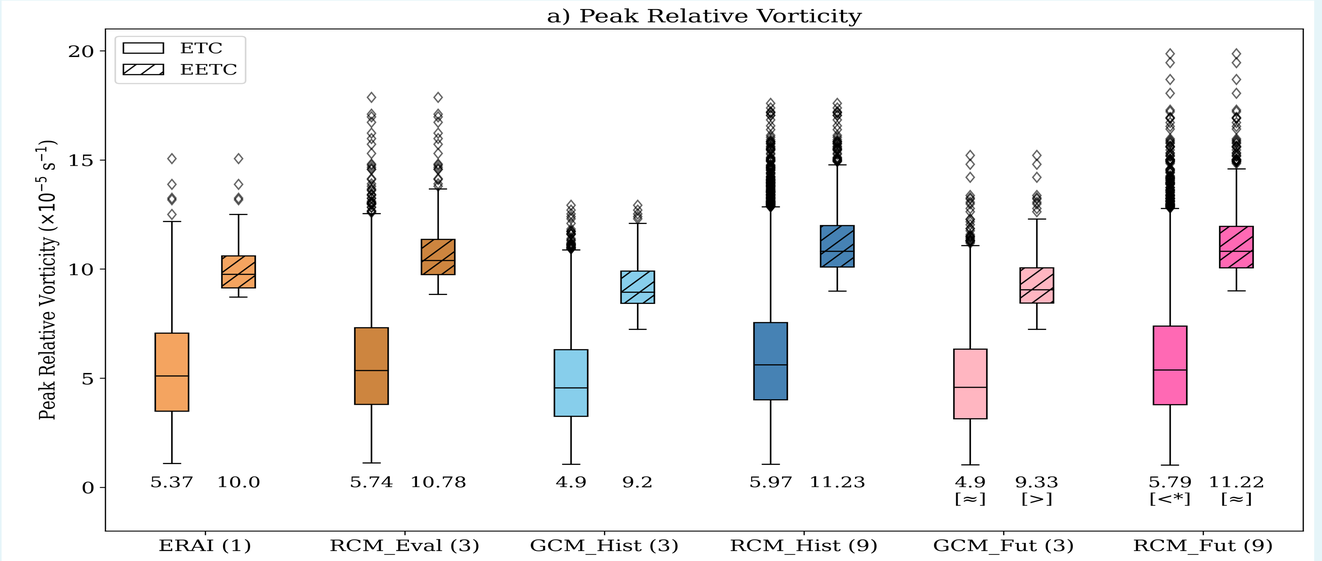
- Extratropical cyclones (ETCs) in South Africa usually occur during the winter season (June, July, and August).
- ETCs influence the Western Cape with extreme rain and strong winds, leading to flooding, causing loss of property and agricultural products.
- Winter ETCs during 2001 caused significant damage in Cape Town displacing 8000 homesteads.
- Implemented Hodges algorithm to track ETCs using relative vorticity.
- We evaluated future changes for 3 global climate models (GCMs) and 3 regional climate models (RCMs) driven by those 3 GCMs. So, 9 RCM simulations in total. Compared future changes (2080-2099) relative to historical simulations (1986-2005).

This analyses can be applied to other regions of interest and applied to anticyclones – which are associated with droughts and heatwaves.

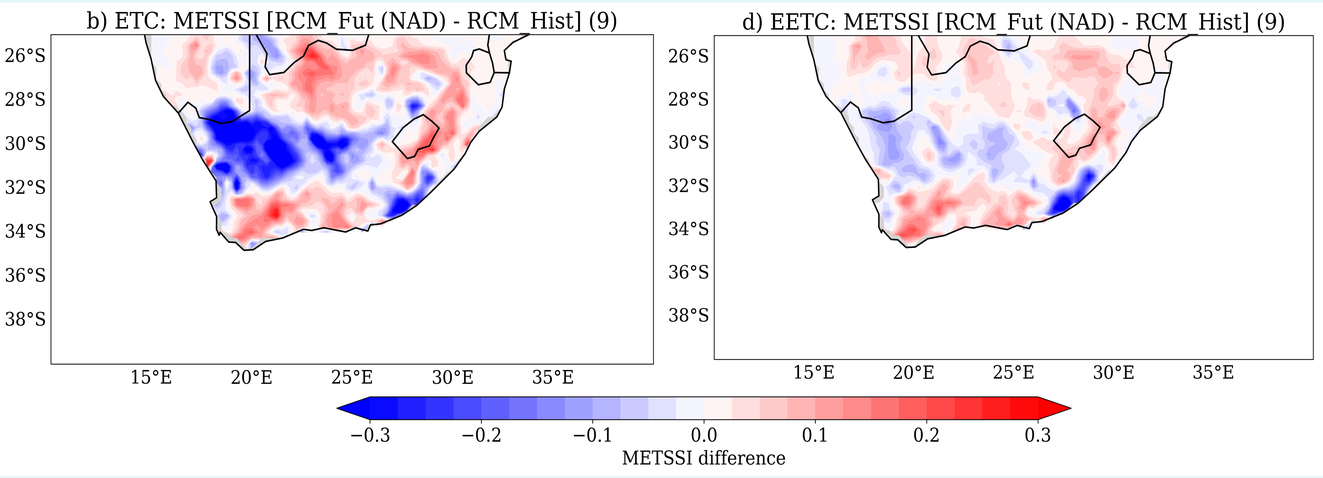
Reduction in extratropical cyclone frequency over South Africa, with an increase in storm tracks along the west coast



Models show mixed trends in cyclone intensity projections



Storm severity varies regionally, with increases in the southern coast



Decrease in ETC rainfall over South Africa, especially near Cape Town coast