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Genito Amos Maure¹ , Izidine Pinto² , Mzime Regina Ndebele-Murisa³ , Mavhungu Muthige⁴ ,
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Introduction



- **Paris Agreement** reached in December 2015 - Signatory countries responsible for keep the rise in global average temperatures well below 2.0°C and particularly below 1.5°C in relation to the pre-industrial period by reducing greenhouse gas emissions according to the guidelines of their National Climate Action Plans.

Introduction



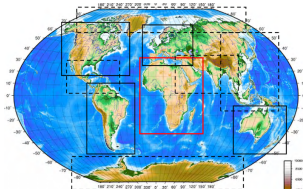
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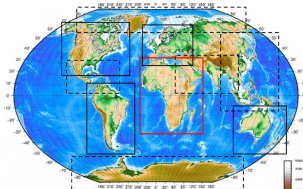


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- Studies over Southern Africa show that strong signals of warming and of drier austral summers already exist (Morishima and Akasaka (2010), Engelbrecht et al (2015), Engelbrecht and Engelbrecht, (2016), Dosio (2017))
- Therefore, it is important to consider the implications of the 1.5° and 2.0°C thresholds for global average temperature increase for the Southern African region.

- Daily Tmax, Tmin, and T and rainfall from 25 CORDEX RCMs [combination of 10 RCMs + 10 CMIP5 GCMs (Nikulin et al. (2018), *in press*)] is analysed over the CORDEX Africa domain



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- Resolution: 0.44° ($\sim 50\text{km} \times 50\text{km}$); Historical (1950-2005) and future (2006-2100), **RCP 8.5** - this comprises the largest set of simulations (25) and can be considered the most realistic scenario of emissions (Business as Usual scenario)

Approach (Cont.)

- **Instead** of the traditional “**future vs. past**” aggregation of the model statistics, we consider **two different time periods** for the scenario, so that in each simulation model, the global warming level is **1.5 °C and 2.0 °C relative to** the average temperature of **1971-2000**.

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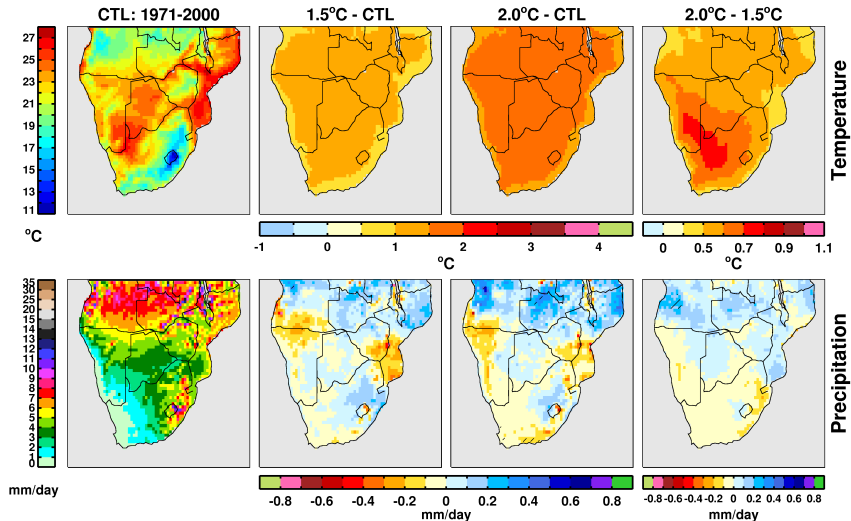
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- We use both in the definition of robustness because the first criterion can be fulfilled even in the case of a very small change, close to zero.

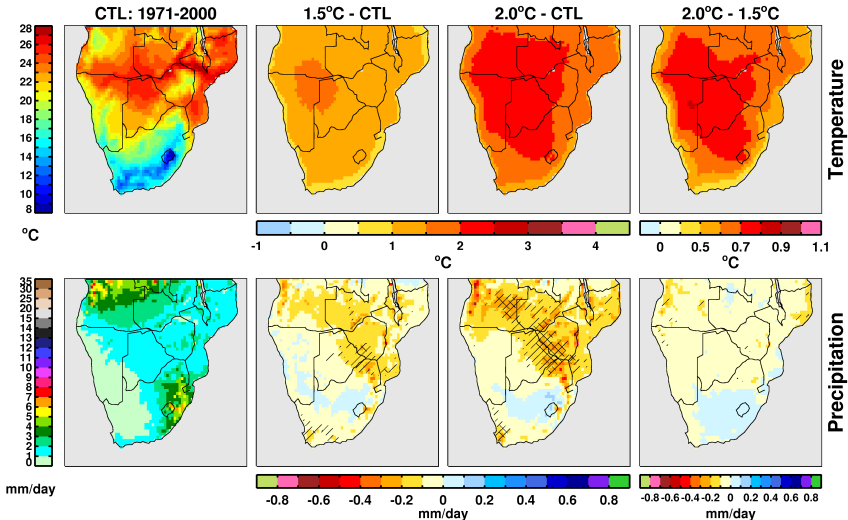
DJF Temperature and precipitation changes

25 CORDEX AFR-44 sim. | DJF | rcp85 | Hatching: 20 sim. (/) & SNR > 1 (\)



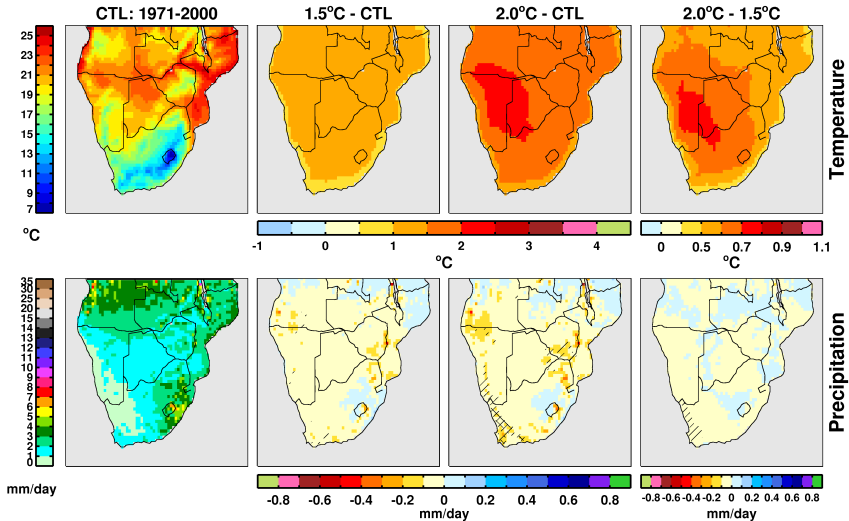
SON Temperature and precipitation changes

25 CORDEX AFR-44 sim. | SON | rcp85 | Hatching: 20 sim. (/) & SNR > 1 (\)



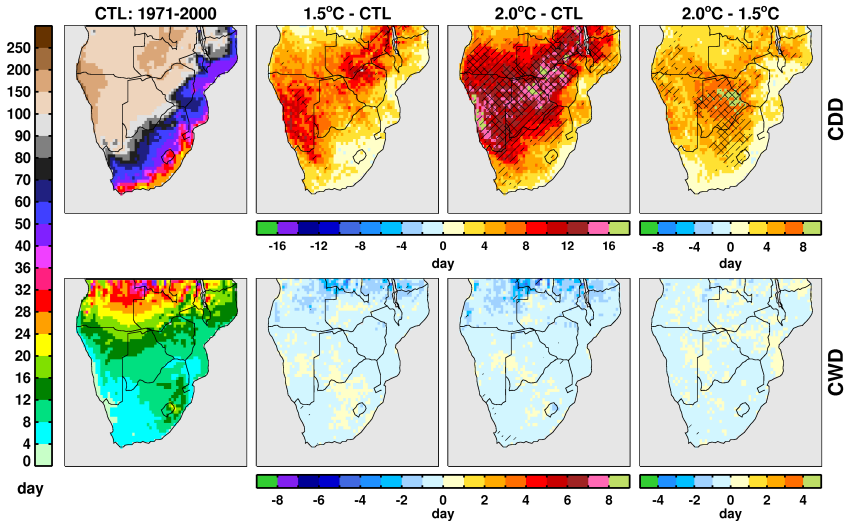
Annual Temperature and precipitation changes

25 CORDEX AFR-44 sim. | ANN | rcp85 | Hatching: 20 sim. (/) & SNR > 1 (\)



Annual mean changes of CDD and CWD

25 CORDEX AFR-44 sim. | ANN | rcp85 | Hatching: 20 sim. (/) & SNR > 1 (\)



Summary

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- For **precipitation**, the **largest difference** between the climate under 1.5°C GWL and that of 2°C GWL is observed during the **SON**. This means that **decreased rainfall and increased CDD** may change and cause **delays in the onset of rainfall**, with potential **negative impacts on water** and dependent sectors/activities such as agriculture, energy and ecosystems.

Obrigado pela Atenção!!

Khanimambo!!

Nabonga!!