Climate change in southern Africa: recent findings and regional response

Emma Archer van Garderen

27 – September - 2013

WATER RESEARCH COMMISSION

CSIR
our future through science

Water Research Commission
Symposium 2013

LOCAL SOLUTIONS - GLOBAL IMPACT

HOW IS TEMPERATURE AND RAINFALL CHANGING AT THE REGIONAL SCALE?

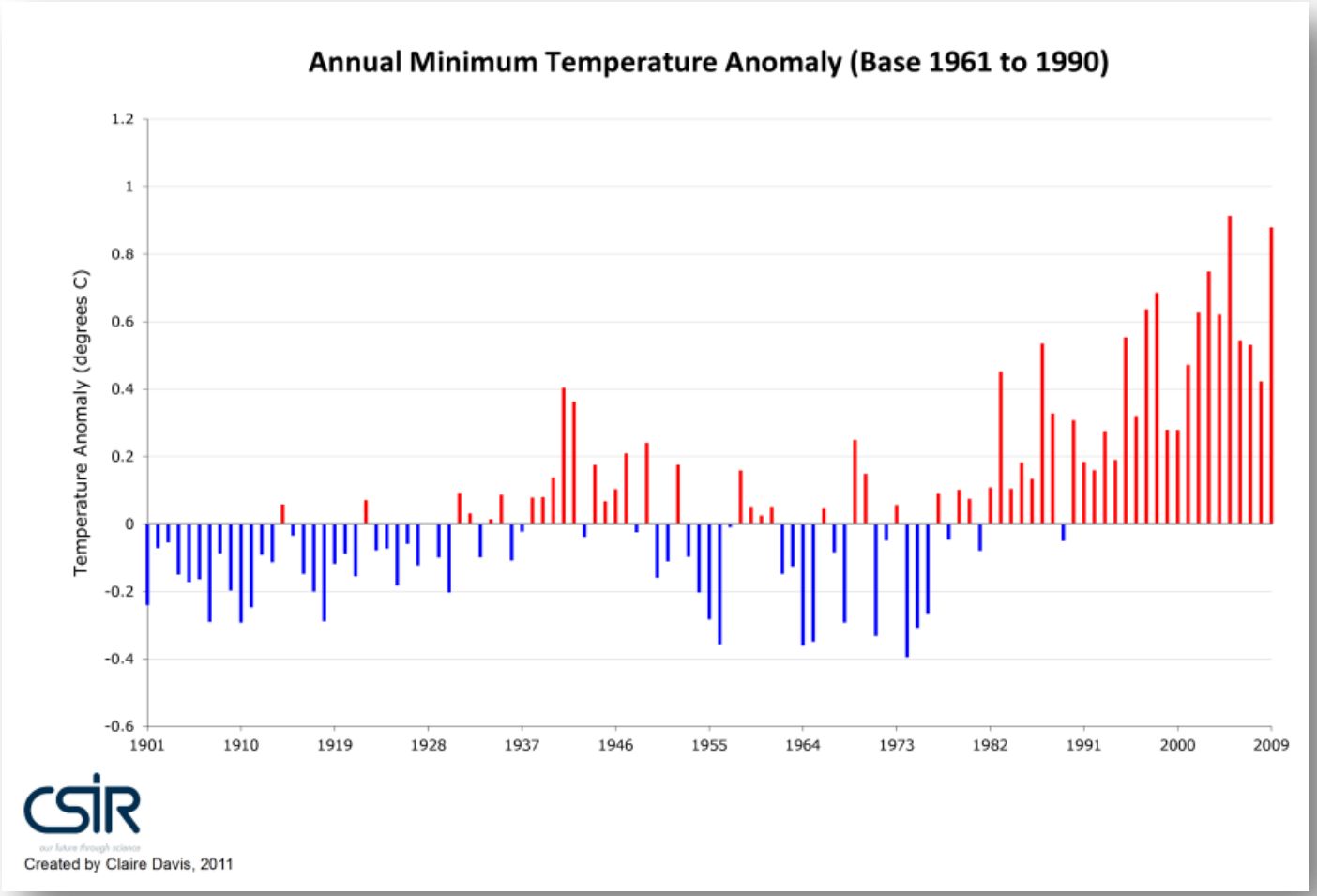
Regional temperature trends (1)

Challenge:

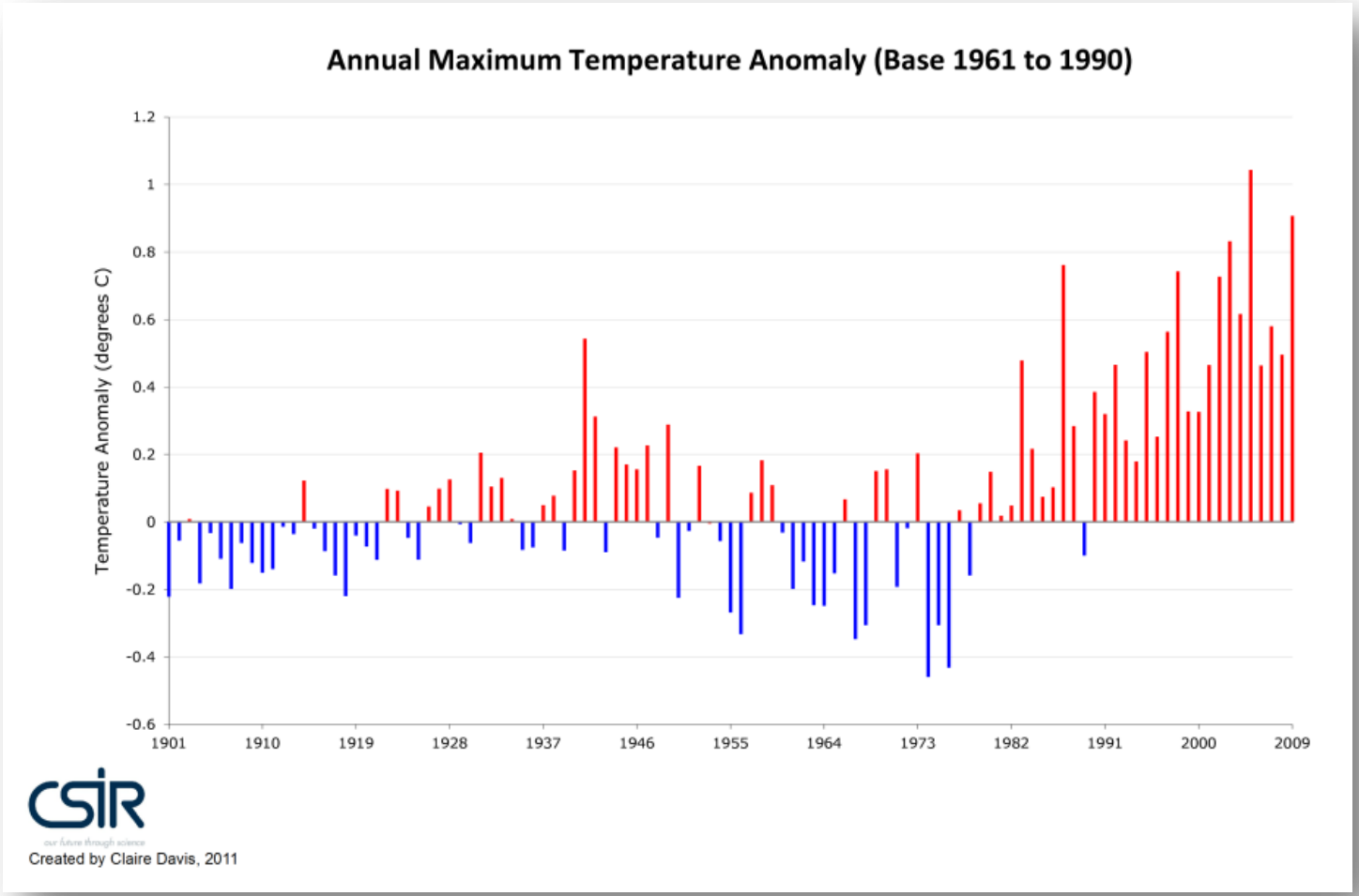
- Lack of accurate, long-term, well-maintained record of climate observations
- Influence of local features as well as regional climate variability (such as El Nino)

Results from a regional analysis of temperature from high-resolution gridded dataset (1901-1991); CRU TS 3.1

Regional temperature trends (2)

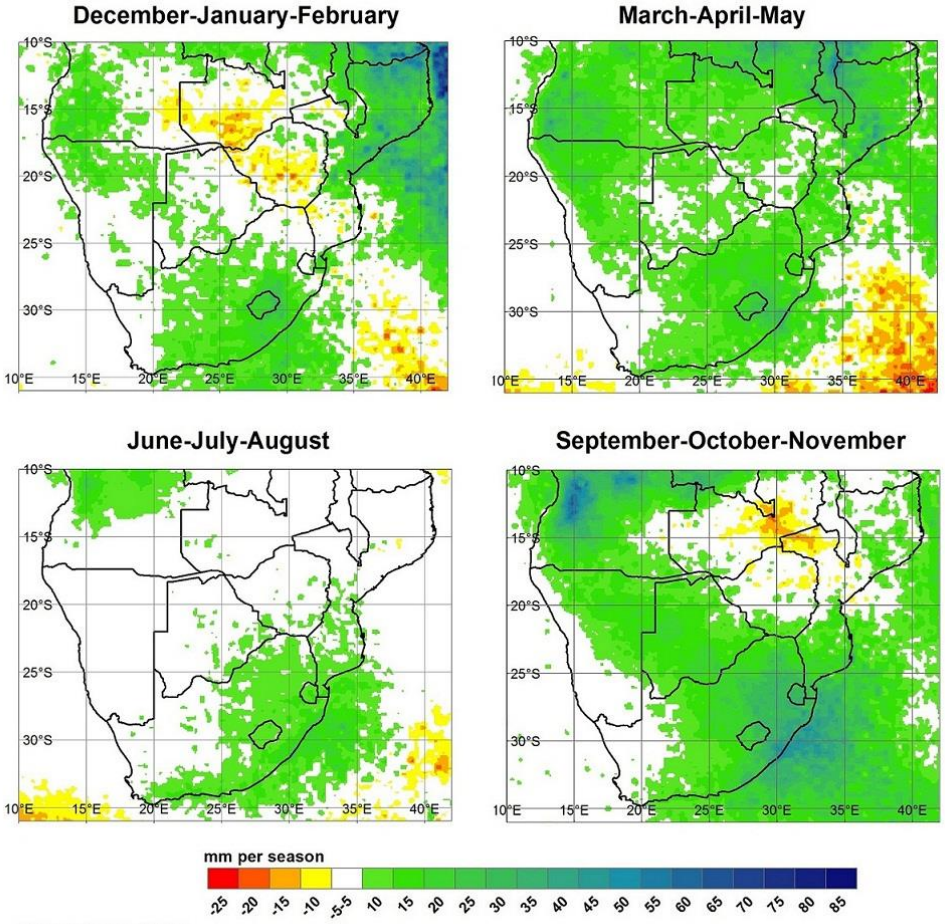


Regional temperature trends (3)



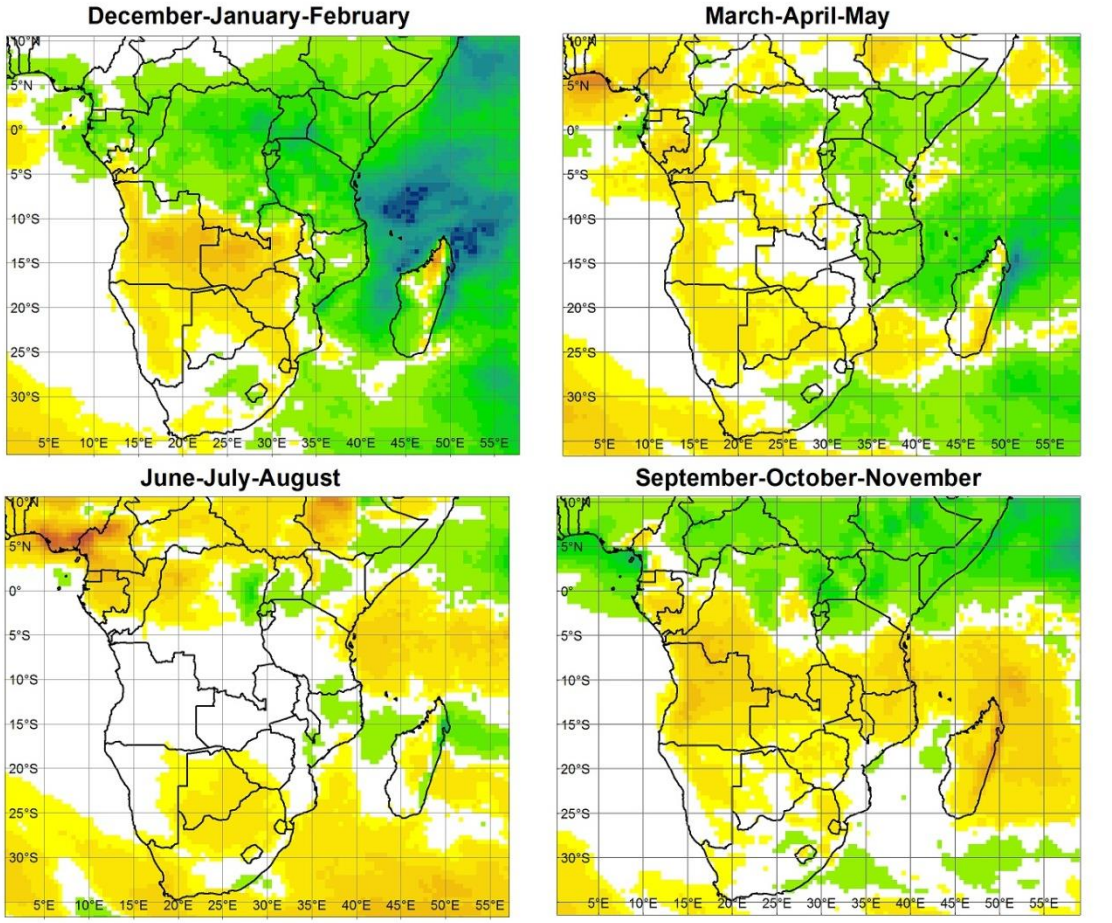
HOW IS CLIMATE EXPECTED TO CHANGE IN SADC?

Southern Africa predictions - statistical downscalings



Data provided by CSAG
Map created by Claire Davis, CSIR

Southern Africa predictions - dynamical downscalings



Areas of agreement

Box 2: Summary and comparison of climate change projections from the GCMs and the two downscaling techniques

	GCM	Statistical Downscalings	Dynamical Downscalings
Time-scale	1960-2000 2030-2060	1961-2000 2046-2065 (A2 emissions scenario)	1961-2000 2036-2065 (A2 emission scenario)
Rainfall	Decreases over central and western southern Africa during DJF and MAM Increases further north over east Africa. Decreases over most of southern Africa during SON and southwest Africa during JJA	Increases over Angola, northern Mozambique and southeast South Africa during DJF and MAM. Decreases over Zimbabwe, Zambia and western Mozambique during DJF and SON.	Increases over East Africa and southeast South Africa, particularly during DJF and MAM Decrease in rainfall projected for rest of southern Africa, except northern Mozambique
Temperature	Increase in mean, minimum and maximum temperature		
	1 - 3°C	0.8 - 3.6°C	0.4 - 3.2 °C
Extreme weather events	Increases in very hot days and heat waves	Increases in very hot days and heat waves	More extreme rainfall events over eastern southern Africa Increase in very hot days – above 35°C

Key areas of impact (selected)

From the 2012 SADC Policy Paper on Climate Change (Climate Change Think Tank, April 2012, SADC House)

- *Impacts on health and human security*: water and food security, direct impacts on disease burden, communicable and non-communicable diseases, disaster risk;
- *Economy* (agriculture, trade, tourism): extensive and intensive agriculture impacts, tourism infrastructure & travel impacts; key commodity impacts;
- *Water*: impacts of increased temperature and evapotranspiration; overlaid with projected increased demand; both quality & quantity challenges;
- *Forestry* (Naidoo *et al* 2013): direct and indirect impacts, including pest and pathogen risk profile change, growth impacts, fire risk changes;
- *Energy* – hydropower impacts, increased demand for thermoregulation impacts.

Local solutions with global impact

Findings shown here; as well as indicated impacts, form the basis for the SADC Climate Change strategy, currently under design.

Led by the SADC Secretariat, seen as key vehicle for SADC Member States to adapt to the arising challenges and benefit from the international community

Endorsed by the SADC Climate Change Working Group – development of both a strategy and an action plan (key need – ways in which to integrate updated findings)

Impact

Particular impact in the area of informing policy and decision making.

Our continued challenge in the region is to ensure that critical trends in regional response are rooted in the latest science, in a meaningful and usable way.