

CLIMATE CHANGE 2013
The Physical Science Basis

**Climate Change: Observations, Projections and
Irreversibility – What does it mean for Africa?**

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Observed change in average surface temperature 1901–2012

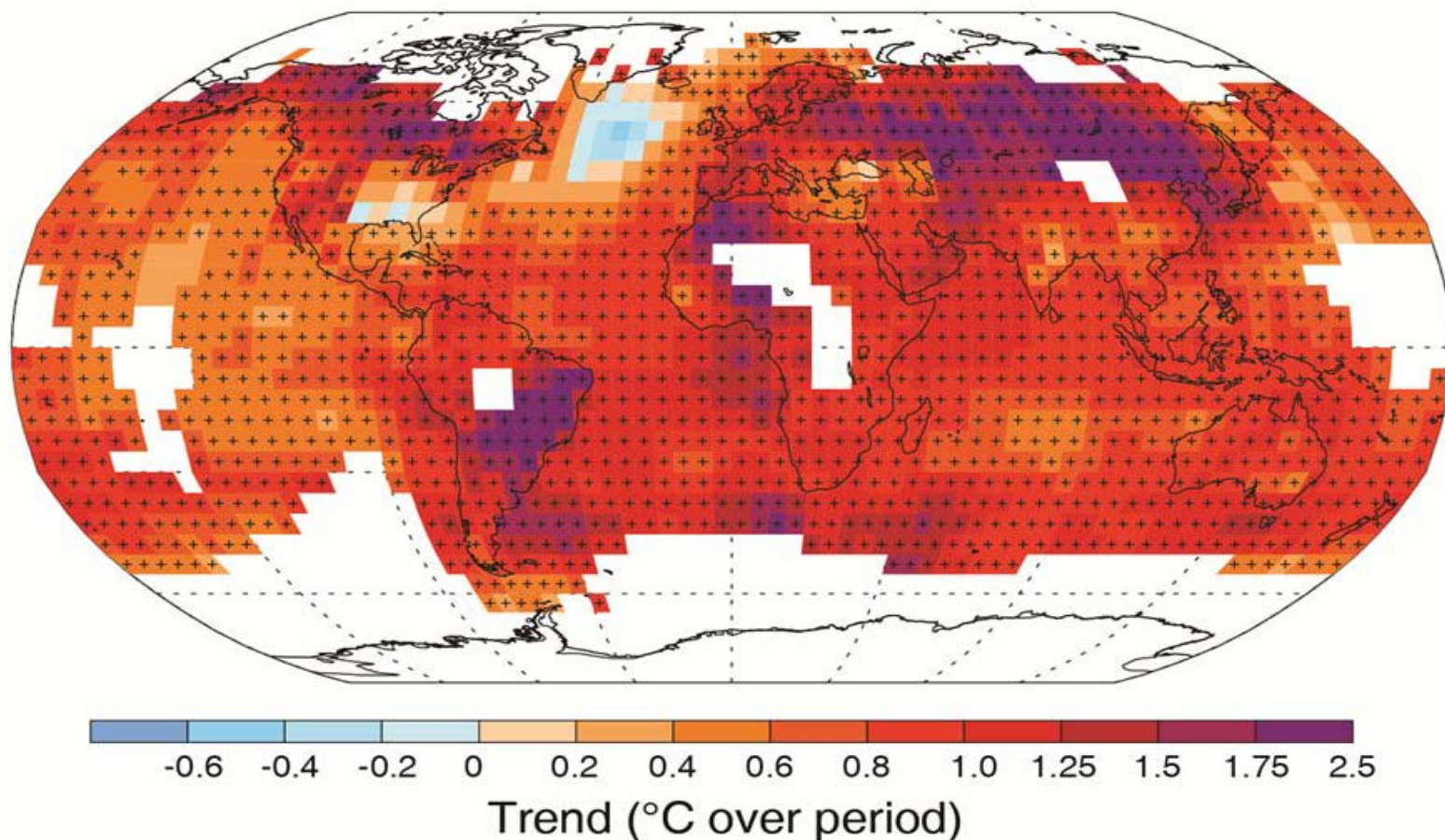


Figure 2.21

Statistically significant warming is found almost everywhere including Africa (10 warmest years in the globe occur after 1997)

Observed change in average surface temperature 1901–2012

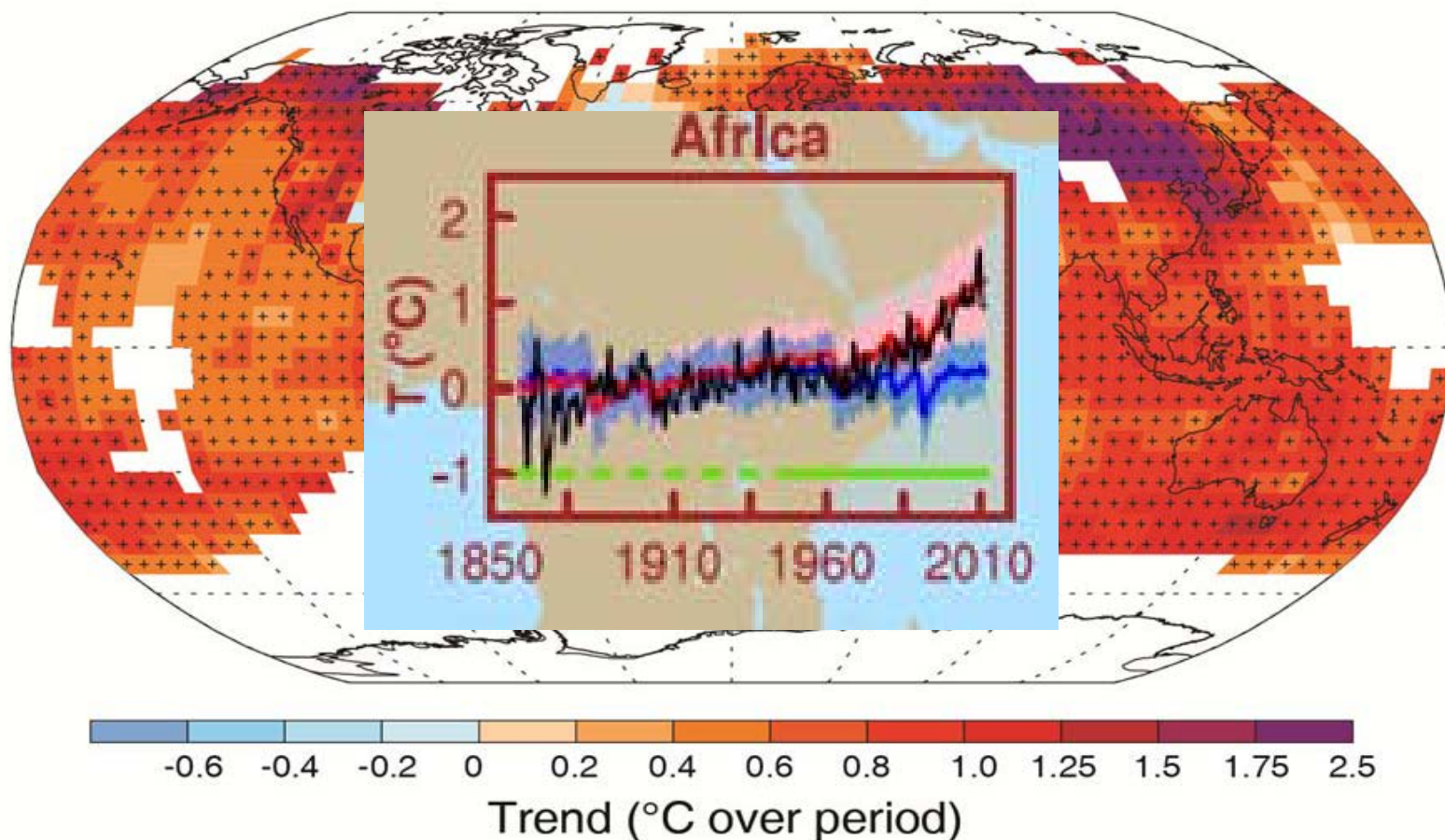


Figure 10.21

Detection and attribution studies show that most of the warming is due to changes in atmospheric composition

GPCC 1901 – 2010

GPCC 1979 – 2010

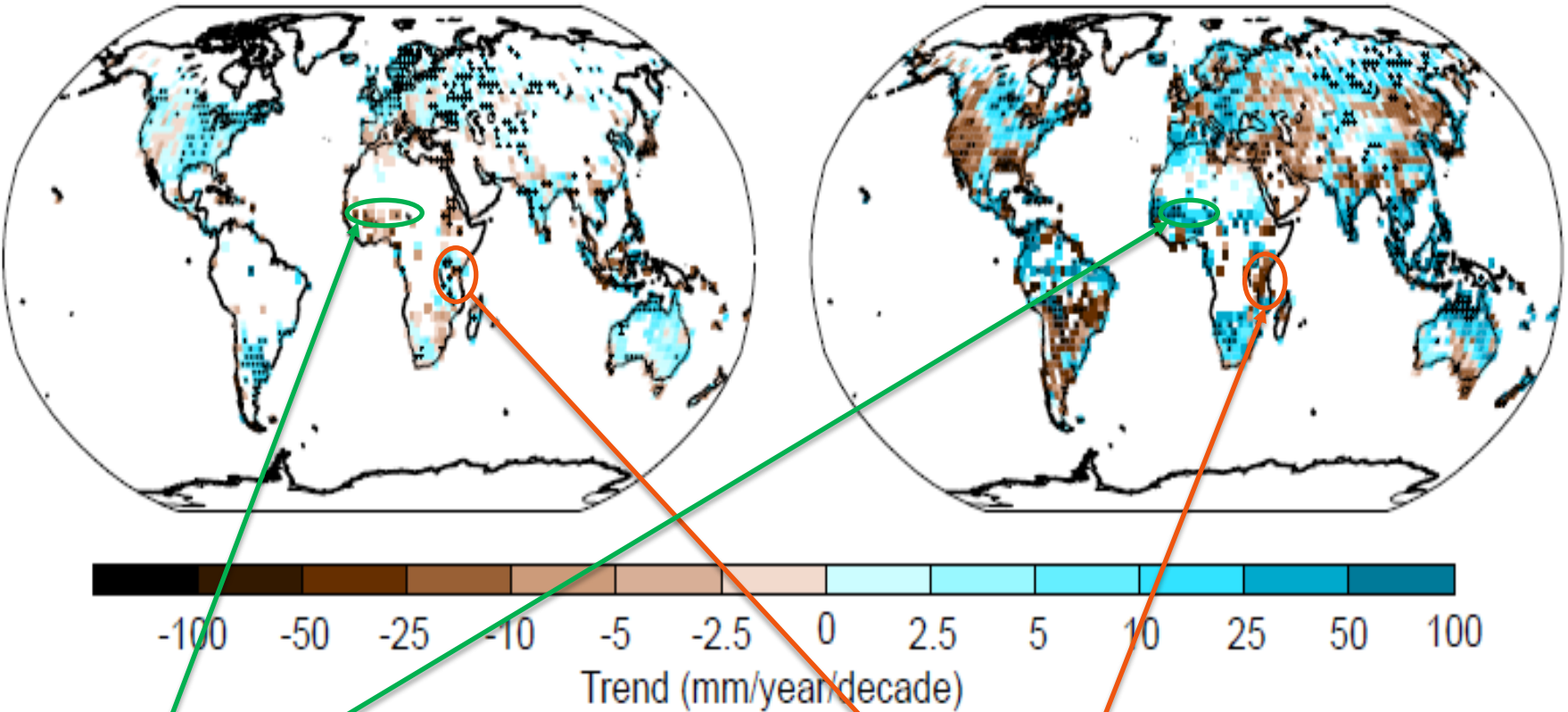
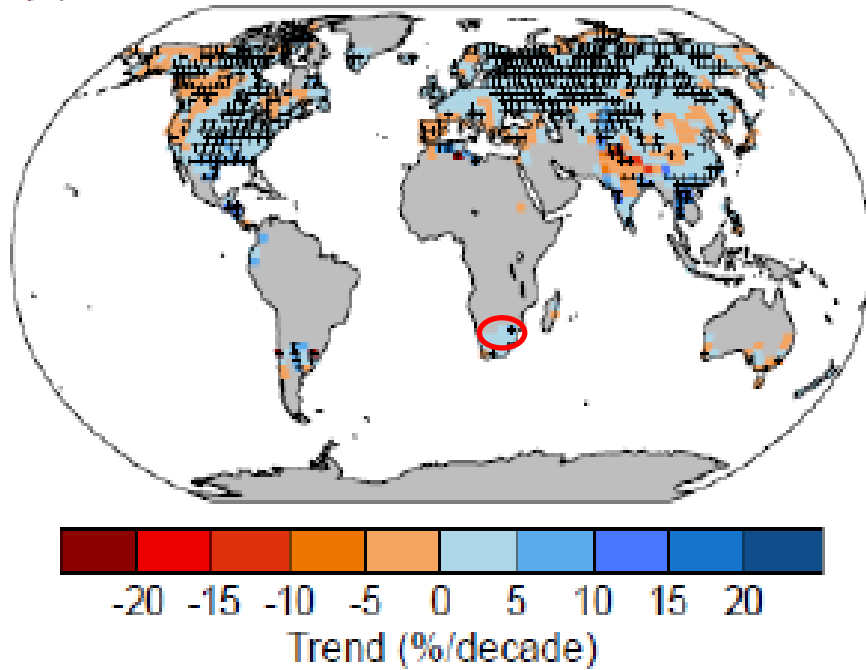


Figure 2.29

The **Sahel** has seen a reversal of the drying trends observed earlier (i.e. low-frequency variability); **East Africa** has seen a higher frequency of droughts in recent years

(b) SDII 1951-2010



(c) CDD 1951-2010

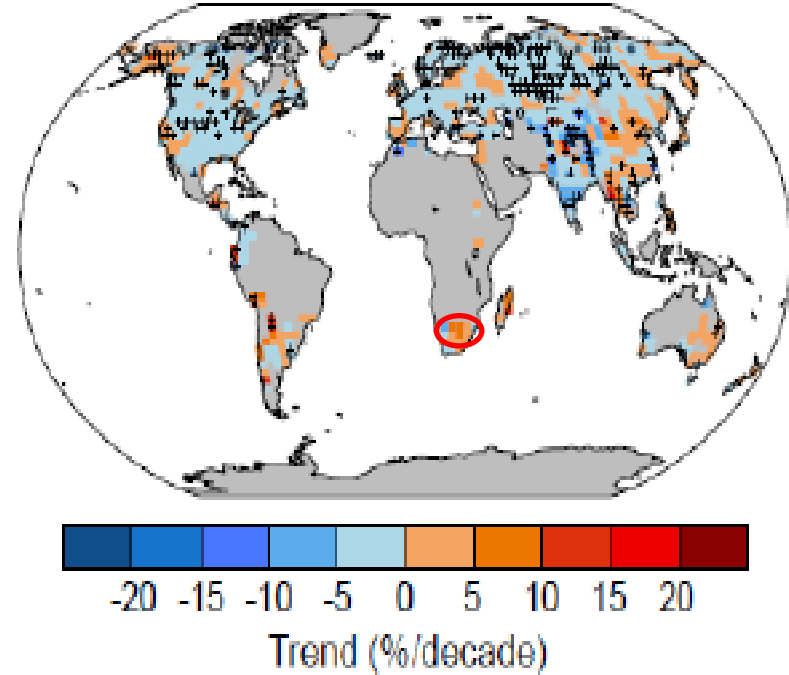


Figure 2.33

The character of precipitation and extremes has been found to change in e.g. southern Africa (more intense rainfall & increasing frequency of dry spells)

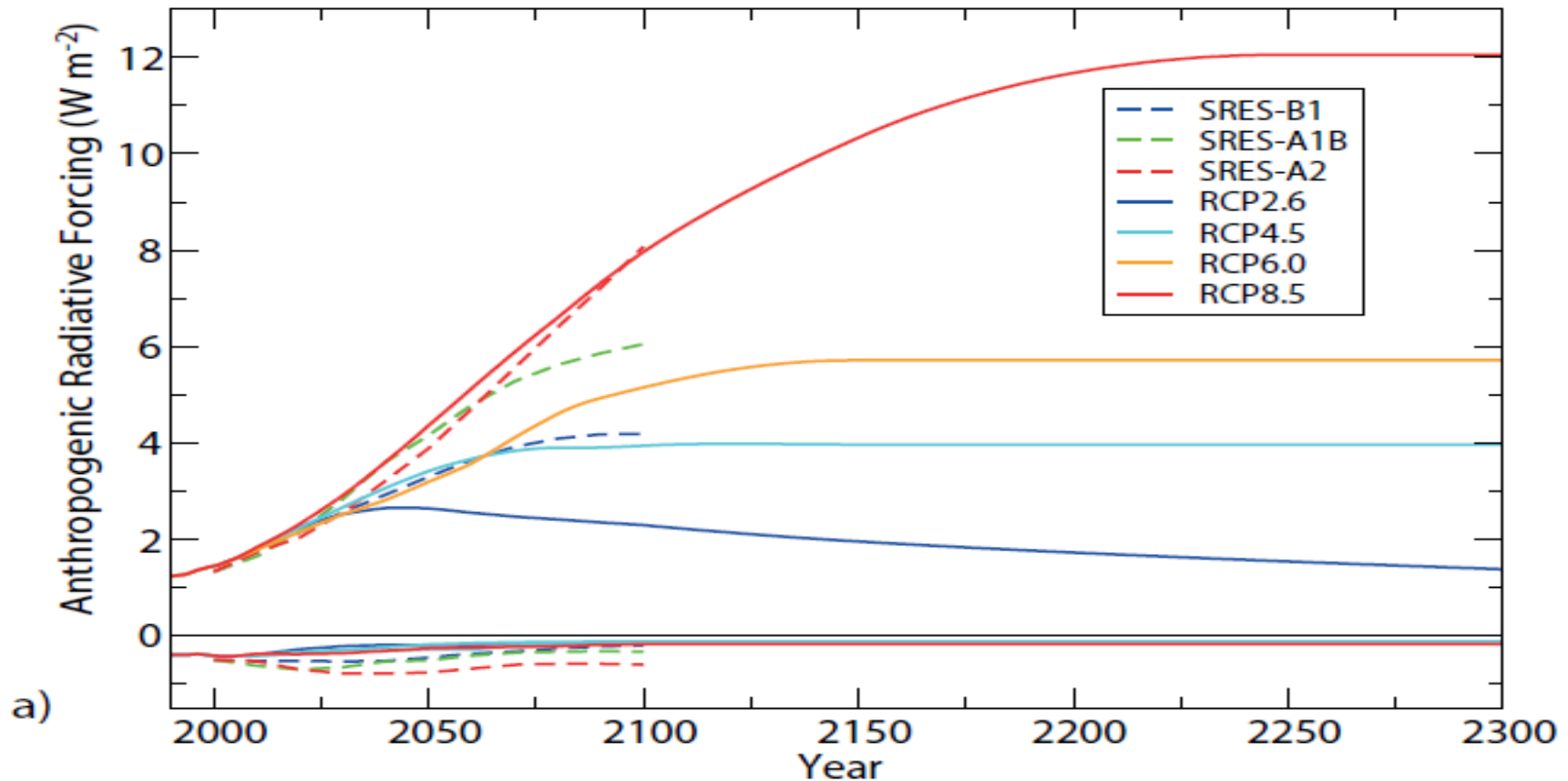


Figure 12.3a

In the long-term, the projected climate is strongly dependent on the pathway of GHG concentrations

RCP 2.6

RCP 8.5

(a)

Change in average surface temperature (1986–2005 to 2081–2100)

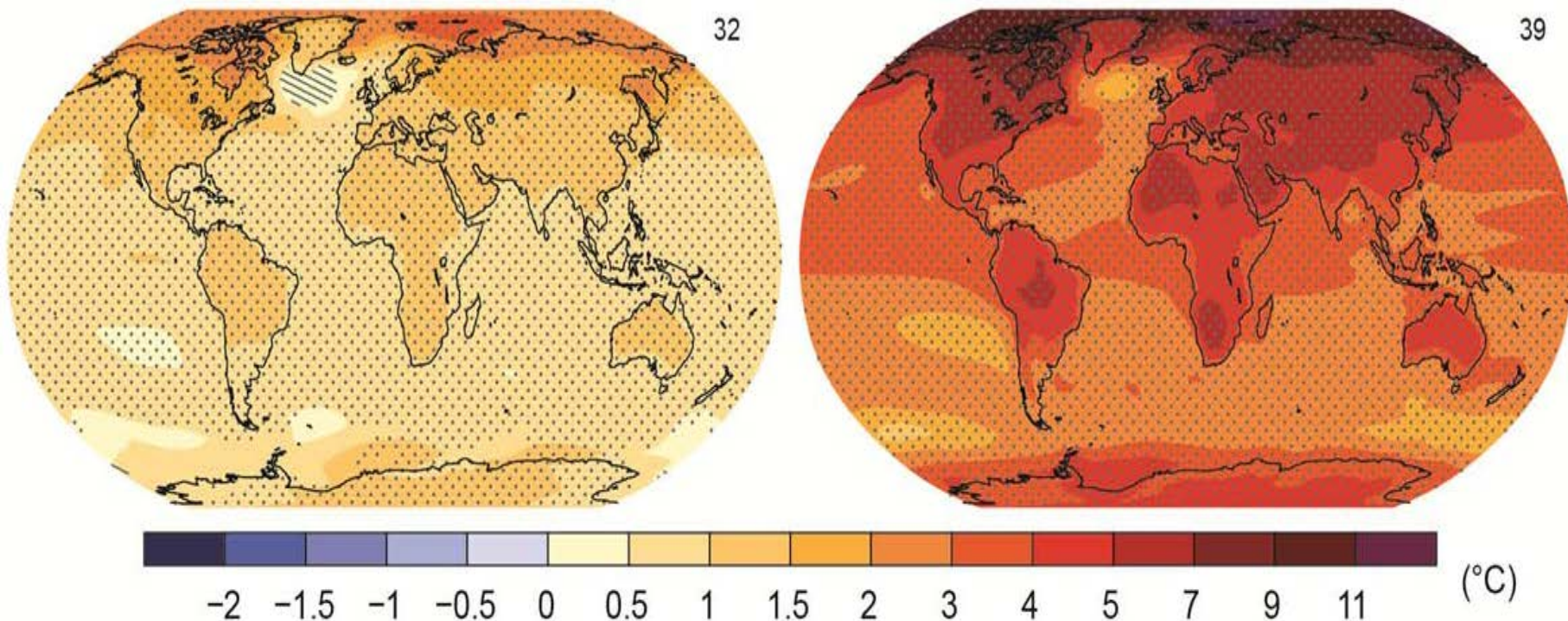


Figure SPM.8

Warming is projected to continue in the 21st century in all RCPs – magnitude is dependent on the forcing (highest in RCP8.5)
(Hatching < 1 σ ; Stripling > 2 σ and 90% model agreement)

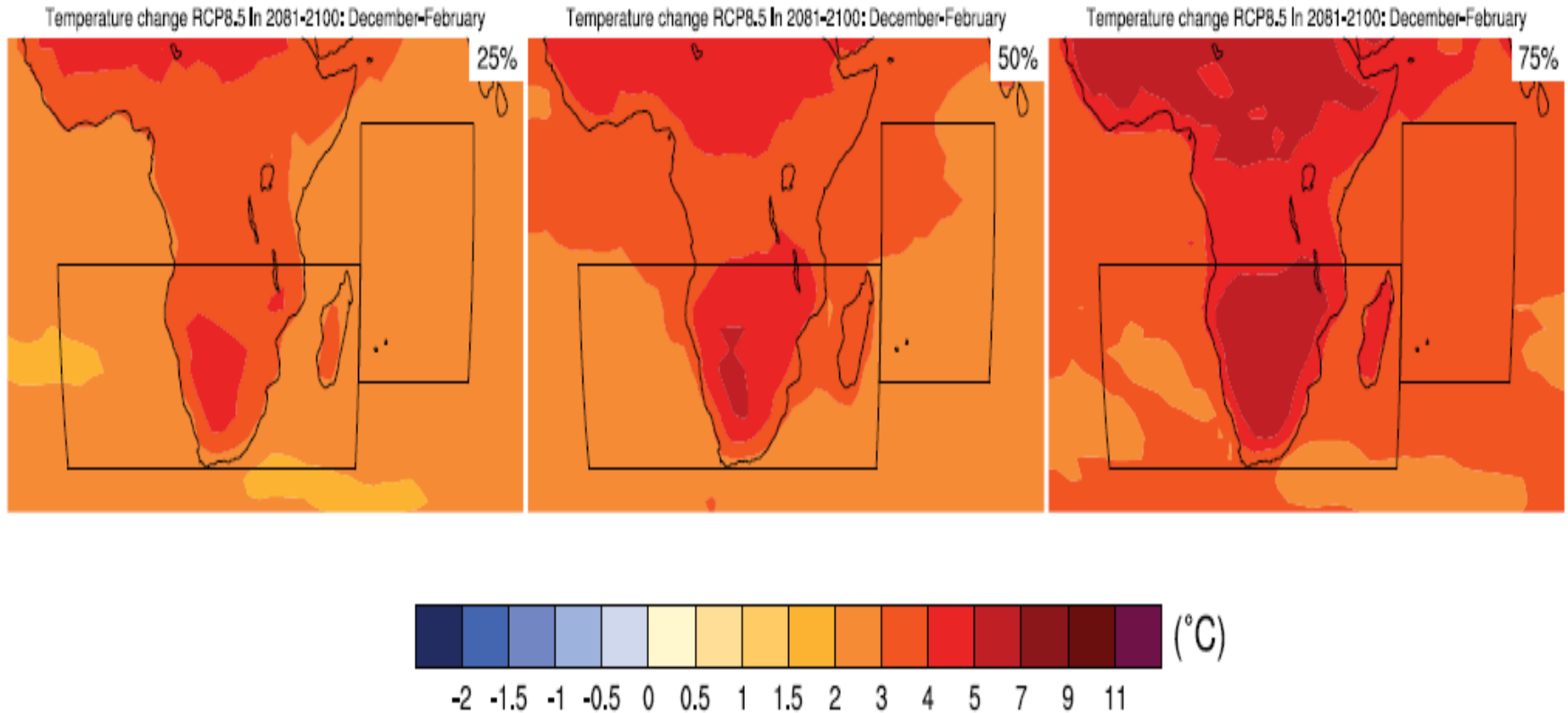


Figure AI.SM8.5.93

Detailed regional and seasonal maps are presented in Annex I: The Atlas of Global and Regional Climate Projections

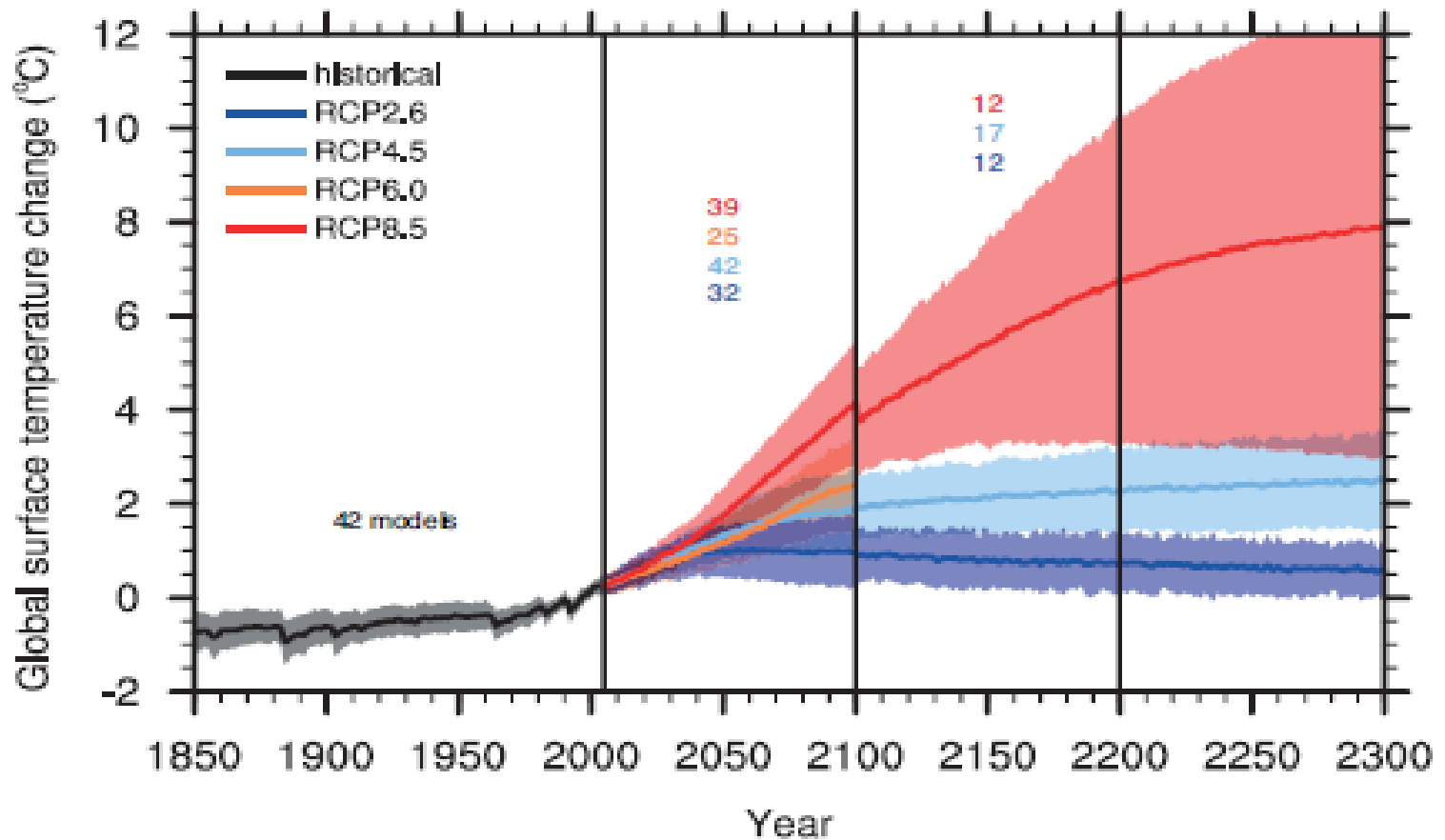


Figure 12.5

It is: 1) unlikely (0 – 33%) that global mean temperature will exceed 2°C above 1851 – 1900 by 2100 in RCP2.6; 2) about as likely as not (33 – 66%) in RCP4.5; 3) likely (> 66%) in RCP6.0; and 4) very likely (>90%) in RCP8.5

(b)

Change in average precipitation (1986–2005 to 2081–2100)

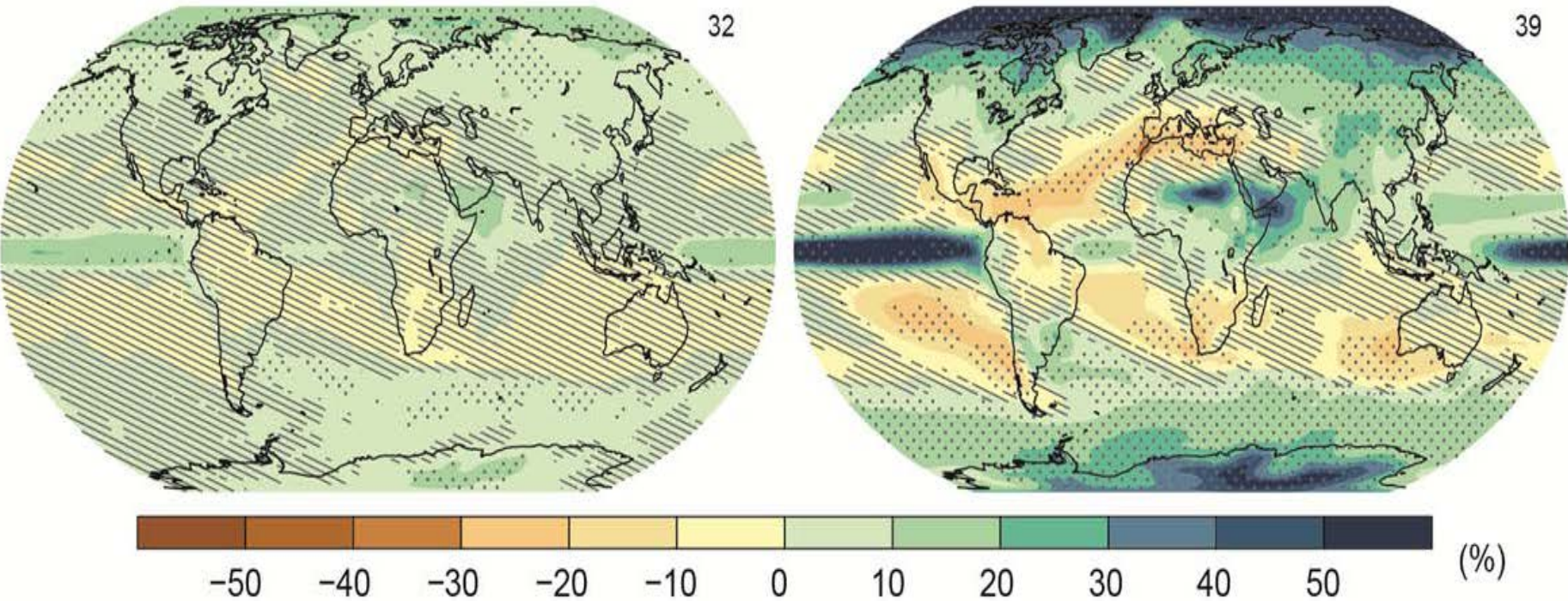


Figure SPM.8

Southern Africa is projected to become drier in RCP8.5 while East Africa and the Greater Horn are projected to become wetter

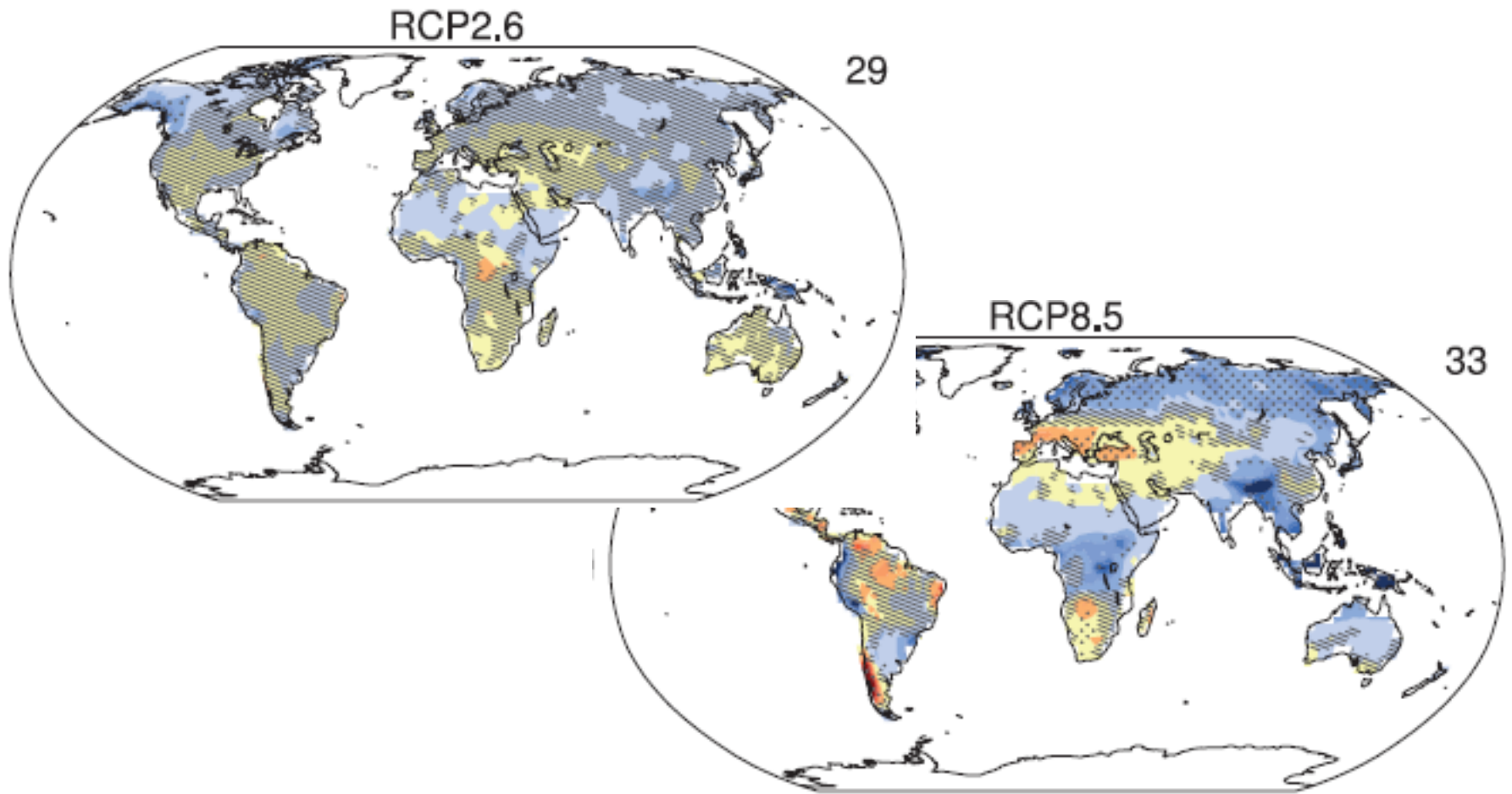


Figure 12.24

Projected change in annual mean runoff relative to 1986-2005 by 2081-2100.

c) Consecutive Dry Days RCP8.5: 2081-2100

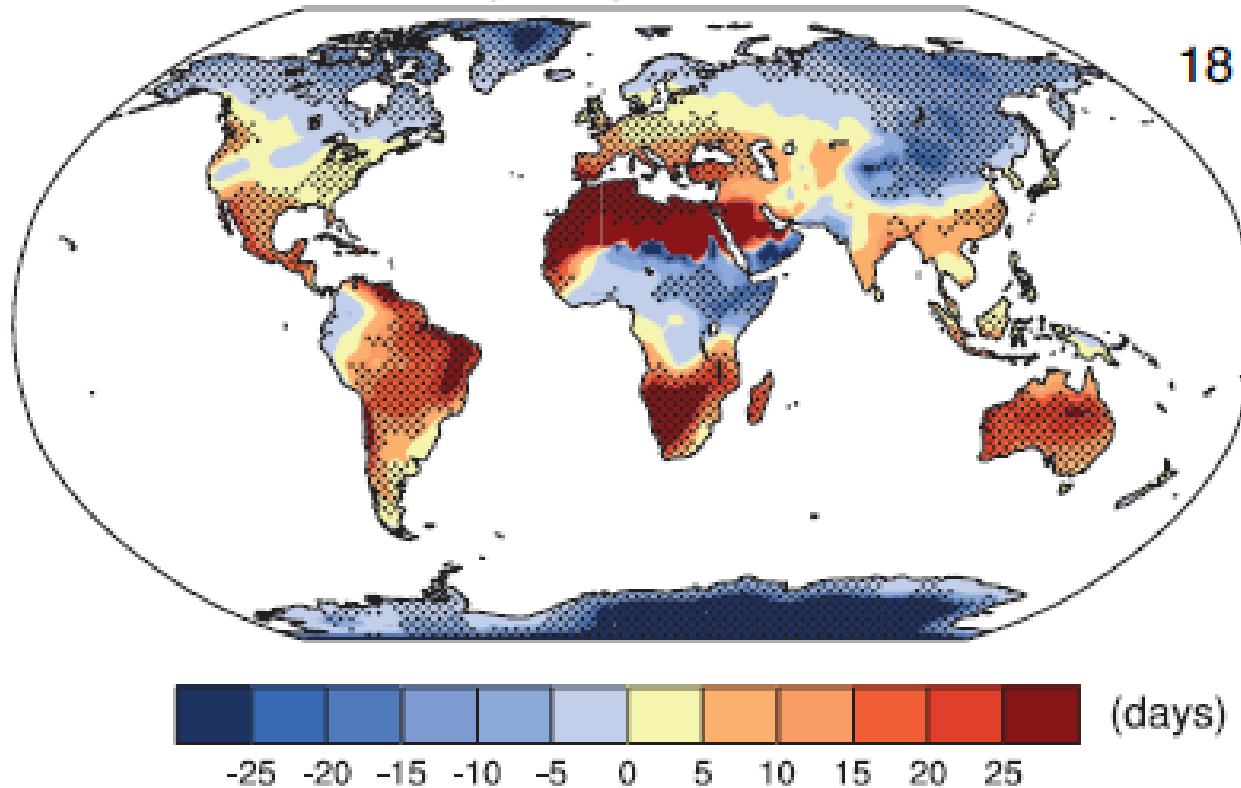


Figure 12.26

An increase in dry spell duration is projected over much of southern Africa by 2081-2100 => agricultural droughts

Cumulative emissions of CO₂ largely determine global mean surface warming by the late 21st century and beyond (see Figure SPM.10). Most aspects of climate change will persist for many centuries even if emissions of CO₂ are stopped. This represents a substantial multi-century climate change commitment created by past, present and future emissions of CO₂. {12.5}

Global warming and anthropogenic climate change will be continue to be experienced for many years/decades in the future

- Long residence time of the GHGs
- Heat stored in the deep ocean
- Emphasis on adaptation

The IPCC does not conduct new research neither does it monitor climate-related data. Instead, it assesses available scientific information on the basis of published and peer-reviewed scientific and technical literature

Africa remains the most underassessed continent because of less scientific research output, and unavailability and/or 'inaccessibility' of observational data

Climate Change 2013: The Physical Science Basis

Working Group I contribution to the IPCC Fifth Assessment Report

Further Information
www.climatechange2013.org

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