

# Climate Change 2013: The Physical Science Basis

Working Group I contribution to the IPCC Fifth Assessment Report

## Regional climate change: Findings of IPCC AR5 WGI

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# Outline

- Observed Changes
- Regional Detection and Attribution
- Regional Projections

## Chapters of Relevance

**Chapter 2 Observations: Atmosphere and Surface**

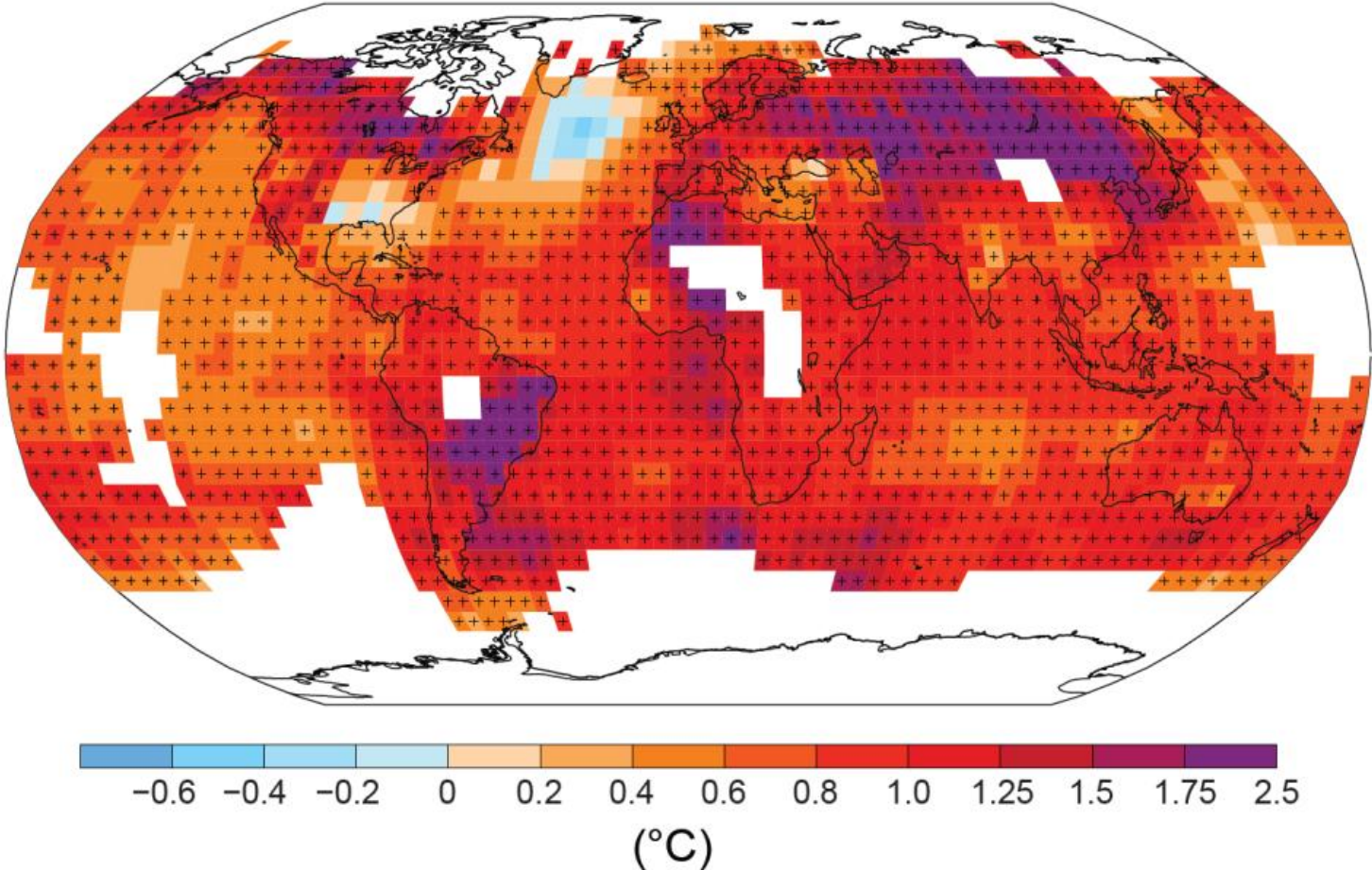
**Chapter 12 Long-term Climate Change: Projections, Commitments and Irreversibility**

**Chapter 14 Climate Phenomena and their Relevance for Future Regional Climate Change**

**Annex I Atlas of Global and Regional Climate Projections**

# Temperature

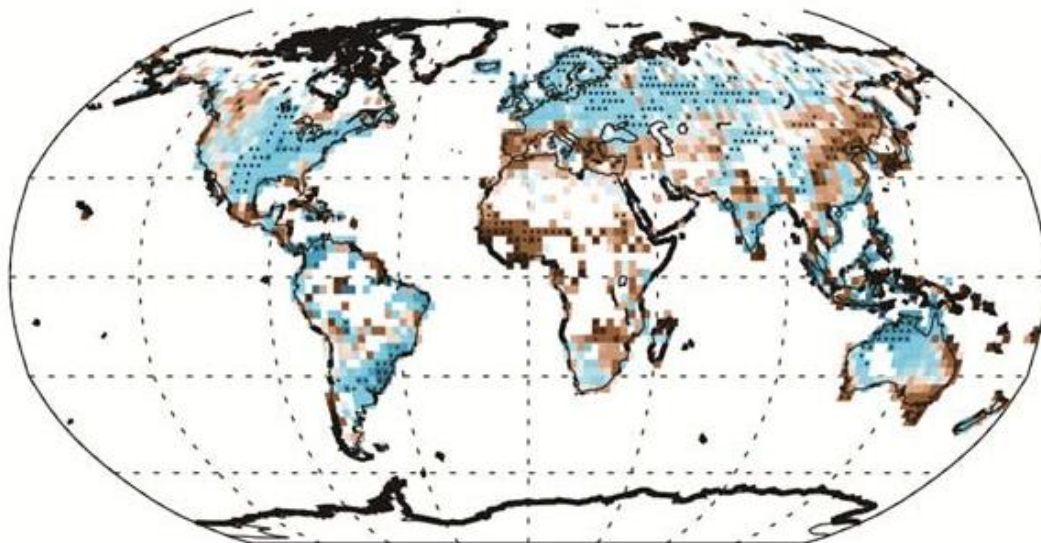
Observed change in surface temperature 1901–2012



# Observed changes in Precipitation – AR4 vs. AR5

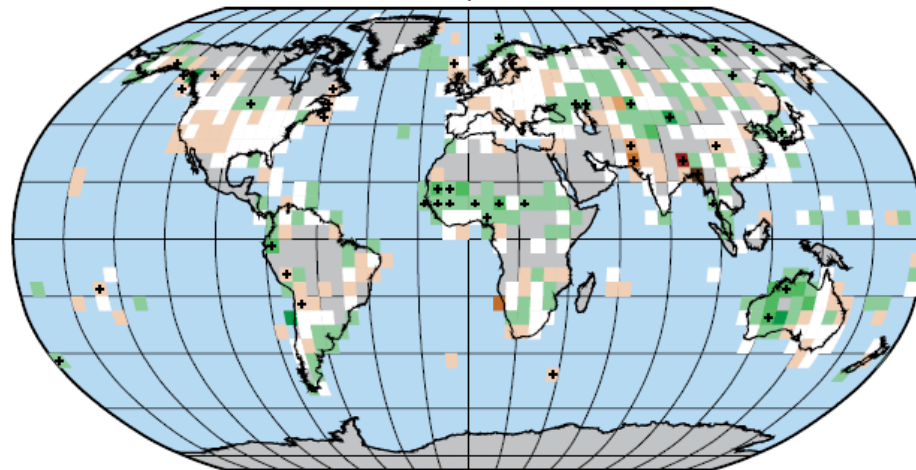
Observed Changes

1951– 2010



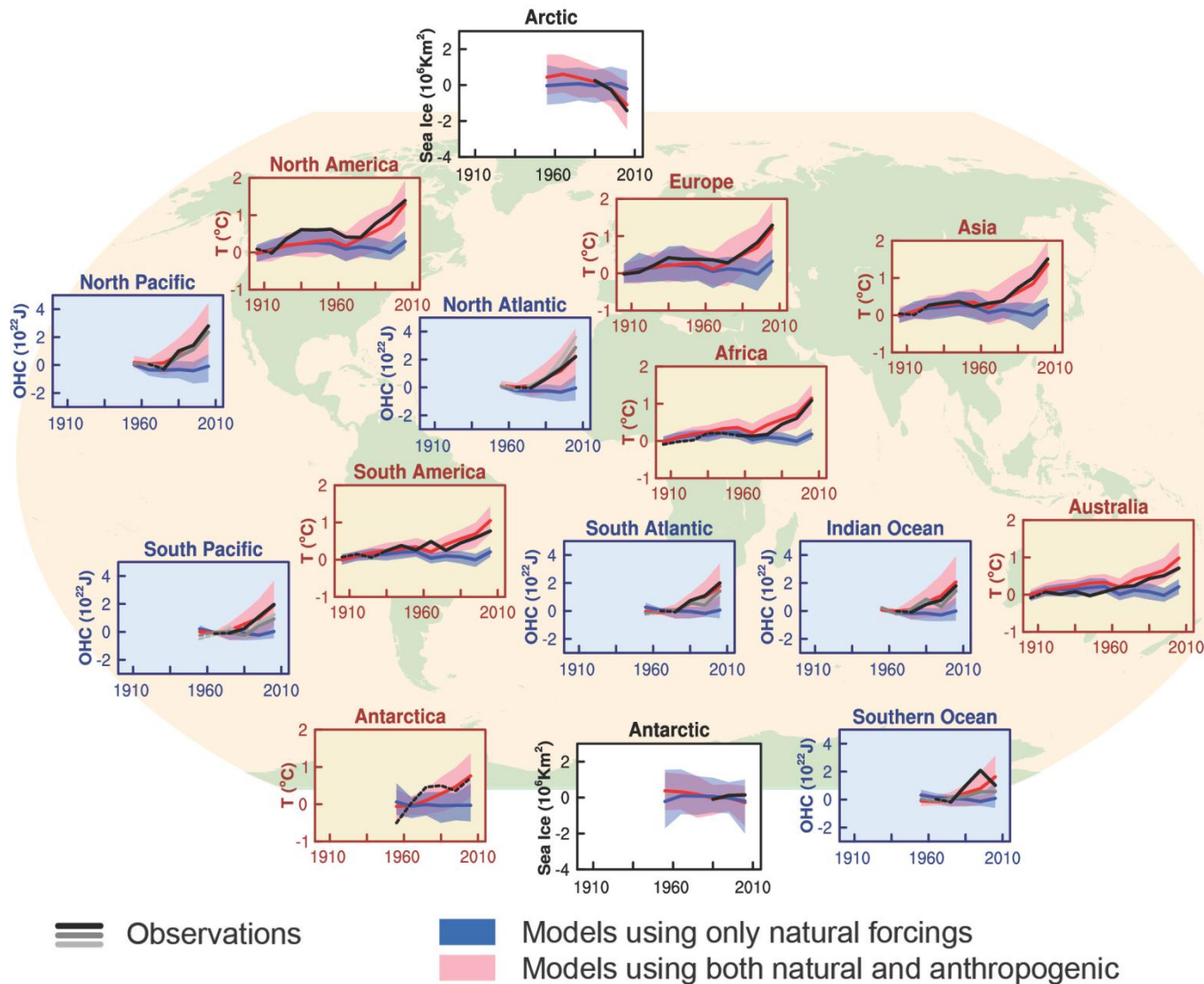
← AR5

Trend in Annual Precipitation, 1979 to 2005



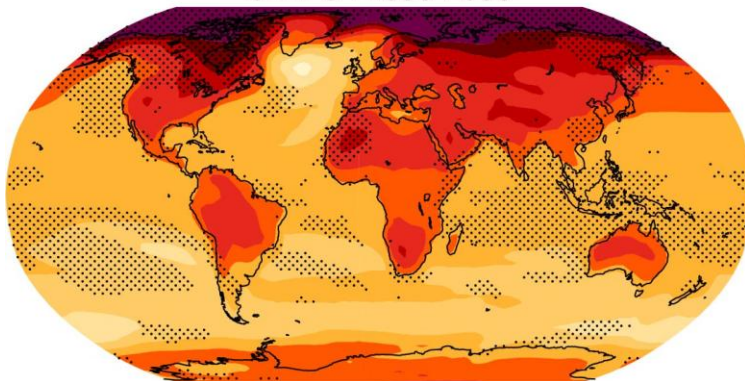
AR4 →

# Regional Scale Detection and Attribution

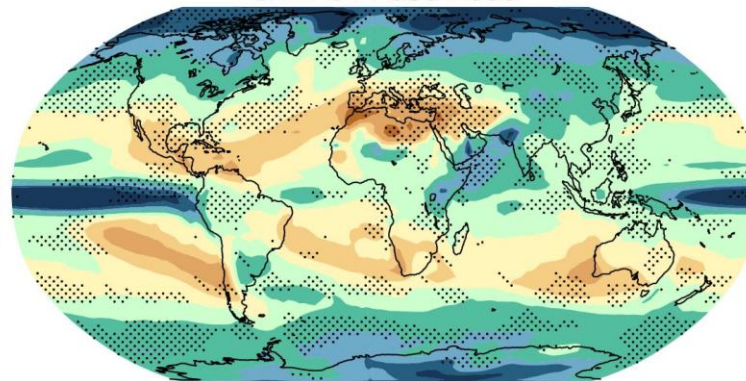


# Projected Changes in Temperature and Precipitation

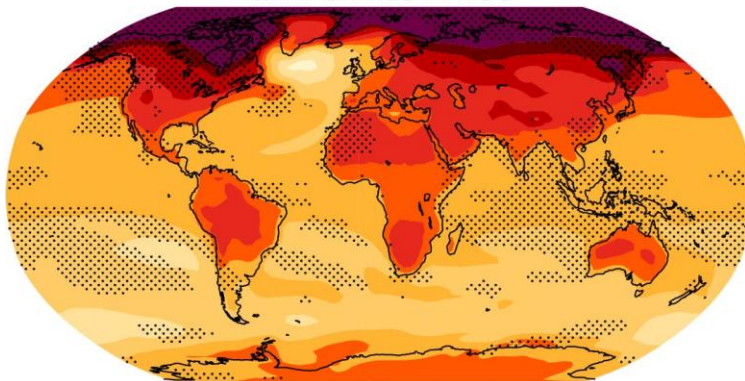
temperature scaled by global T ( $^{\circ}\text{C}$  per  $^{\circ}\text{C}$ )  
CMIP3 : 2080-2099



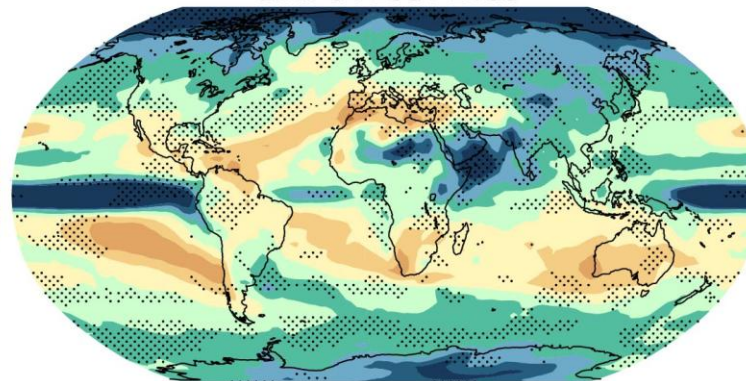
precipitation scaled by global T (% per  $^{\circ}\text{C}$ )  
CMIP3 : 2080-2099



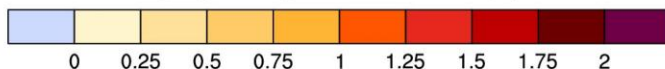
CMIP5 : 2081-2100



CMIP5 : 2081-2100



( $^{\circ}\text{C}$  per  $^{\circ}\text{C}$  global mean change)



(% per  $^{\circ}\text{C}$  global mean change)

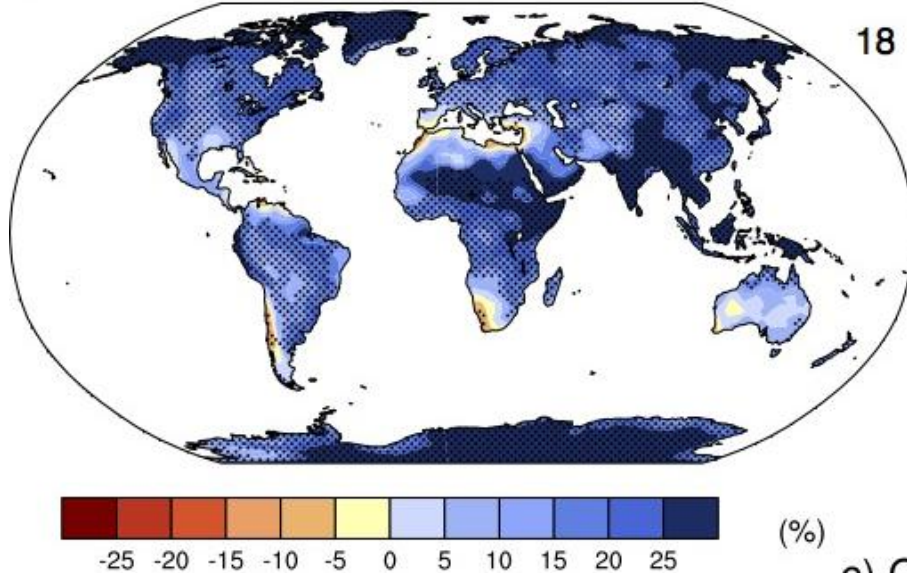


Projected Changes

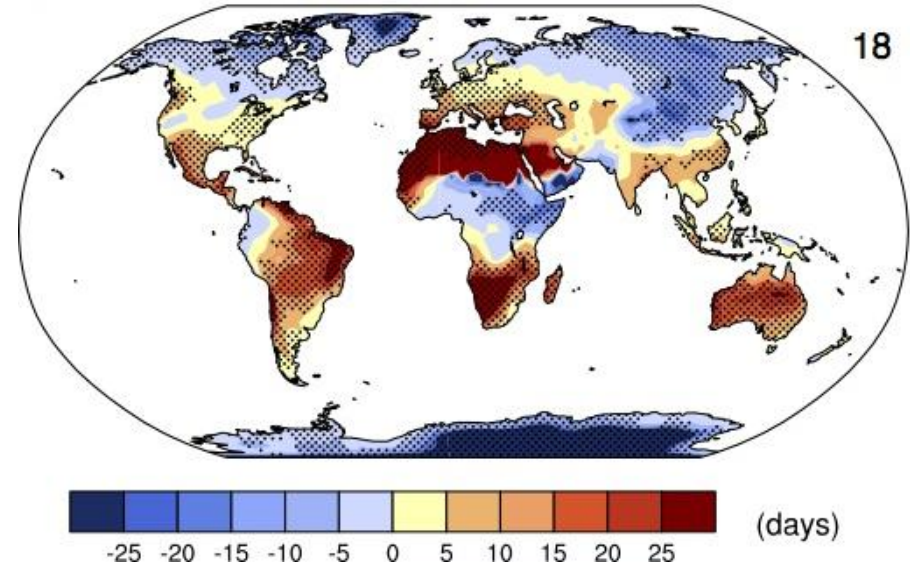
# Changes in Extremes

Projected Changes

b) max. 5 day precip RCP8.5: 2081-2100



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

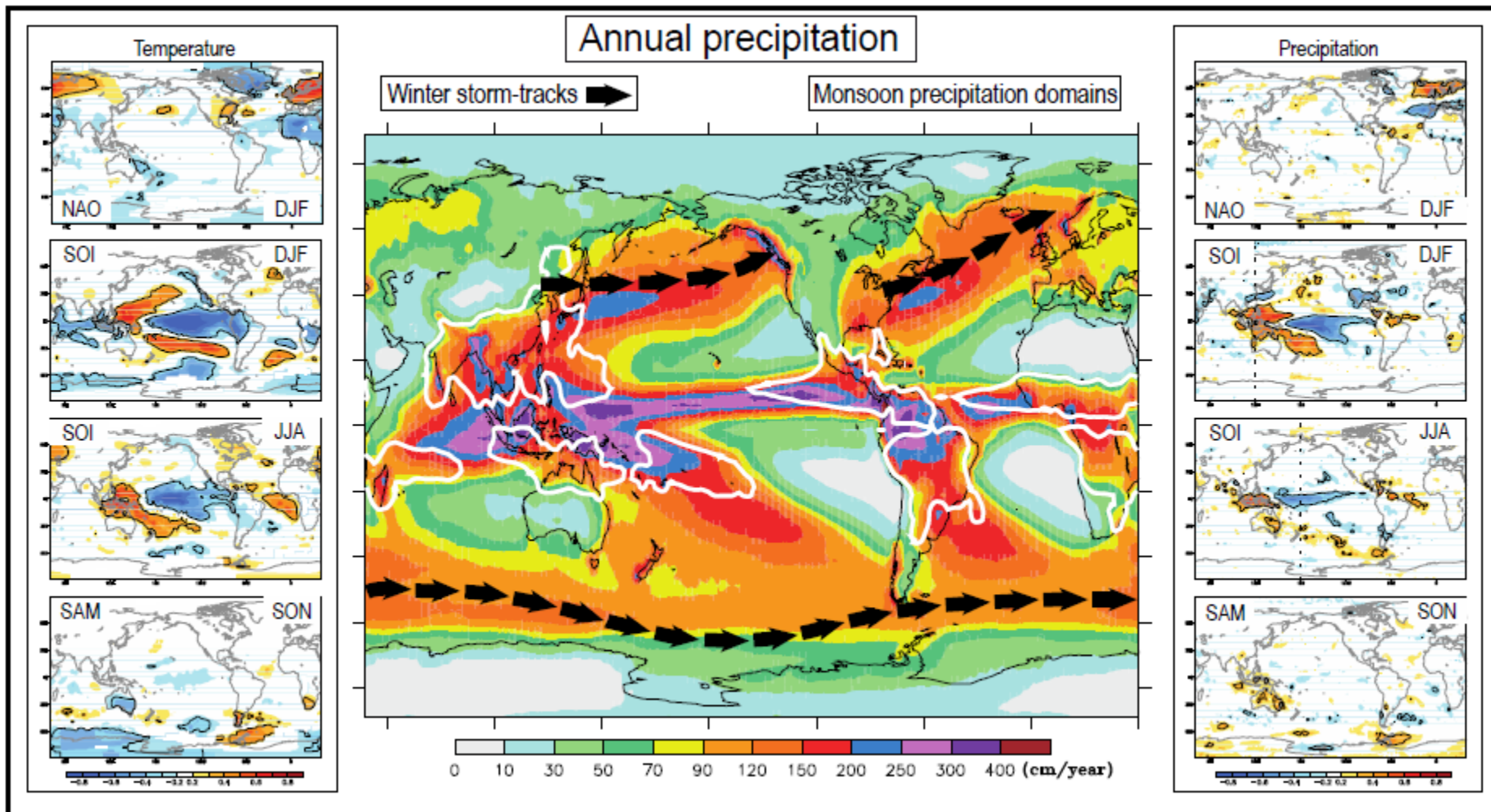


# Regional examples

Monsoons  
Tropical Cyclones  
**ATLAS**

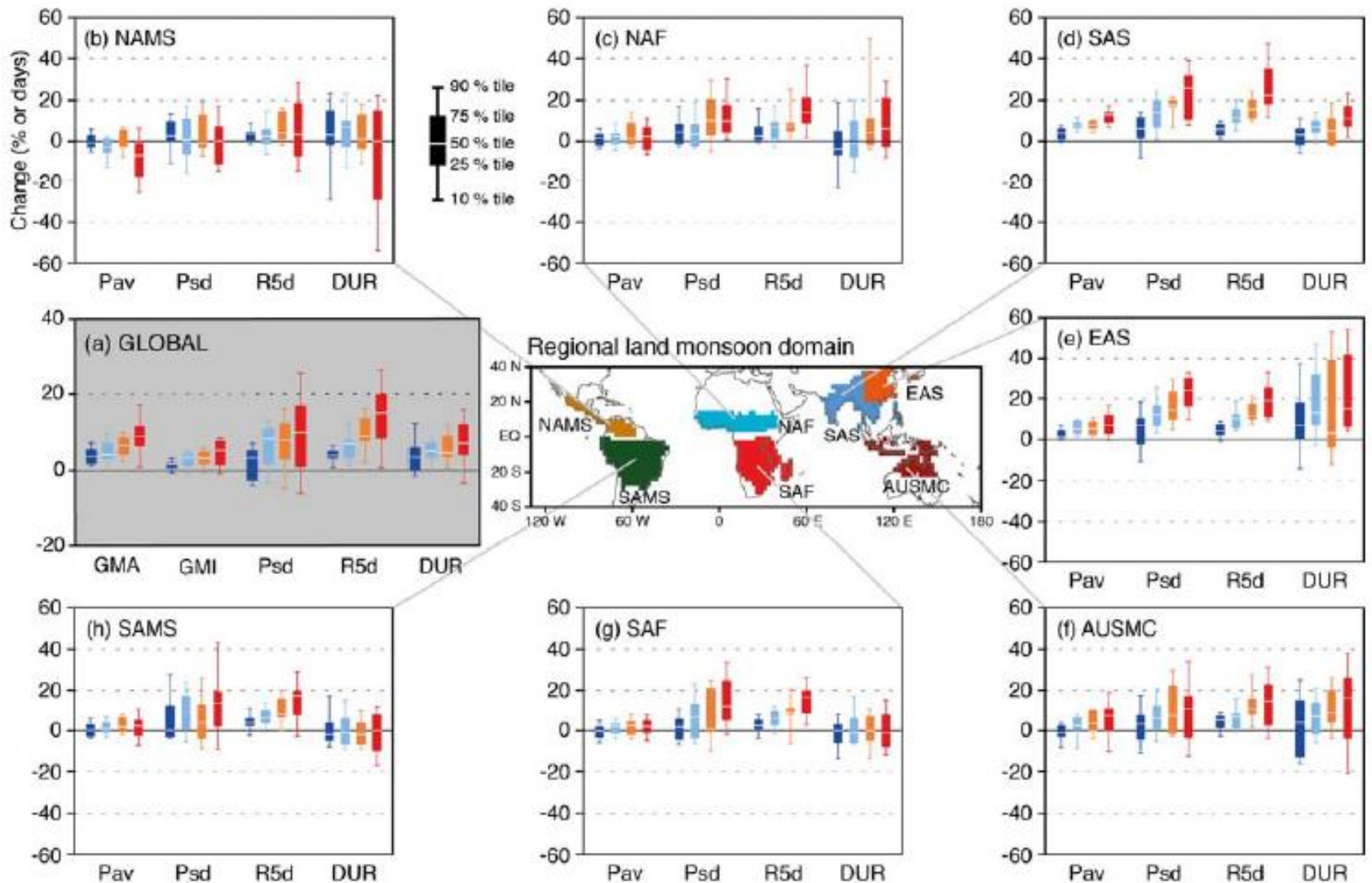


# Portraying regional climate change in WGI – *through important climate phenomena*

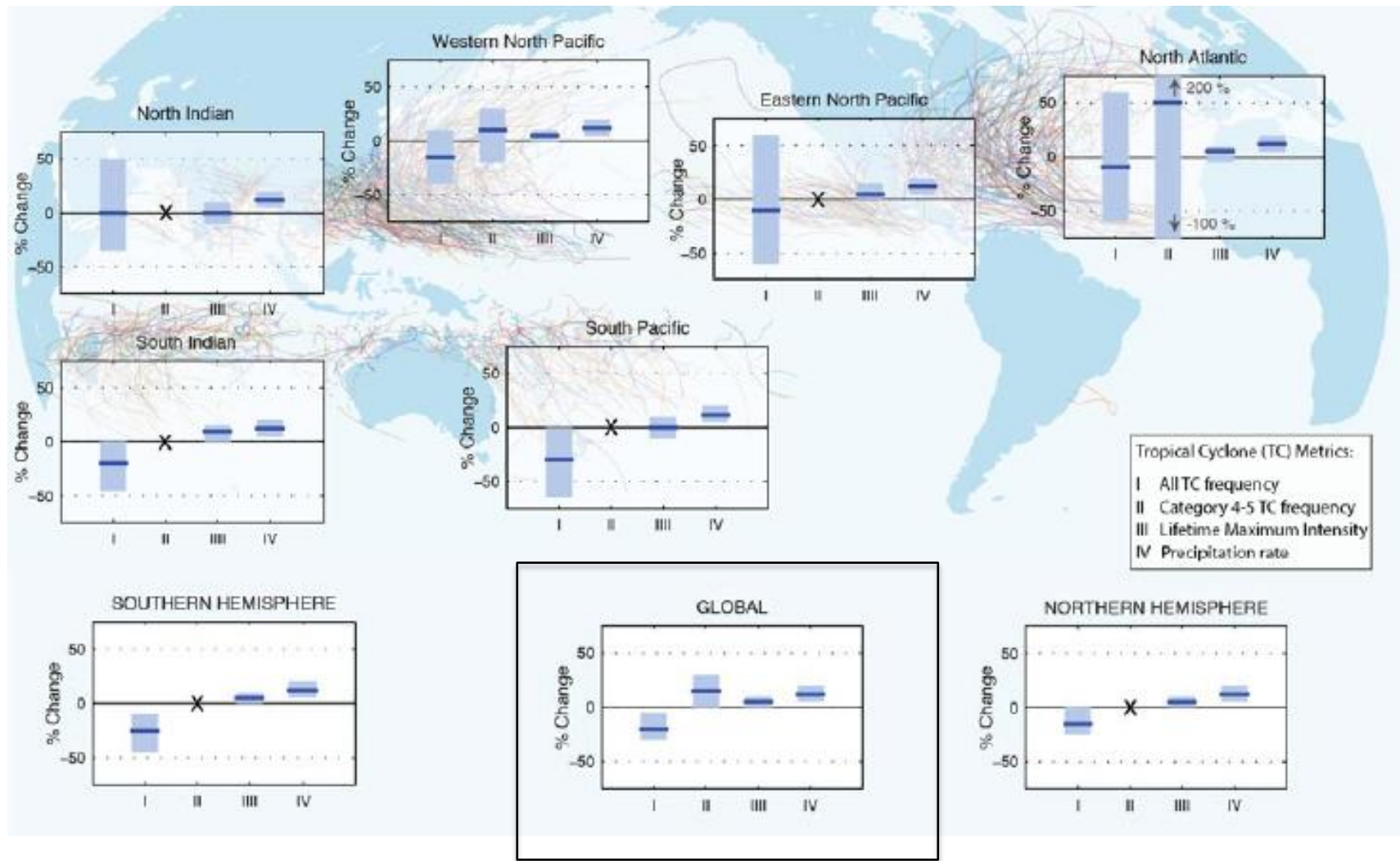


# Monsoon systems

## Regional Changes

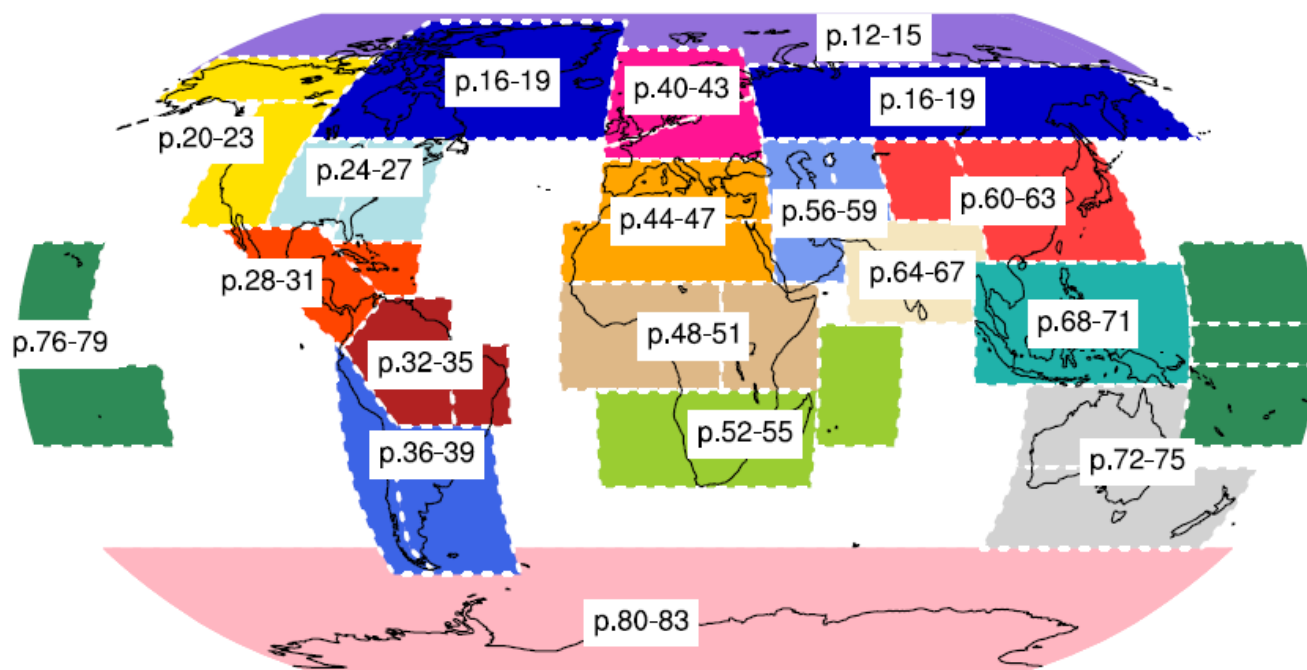


# Tropical cyclones

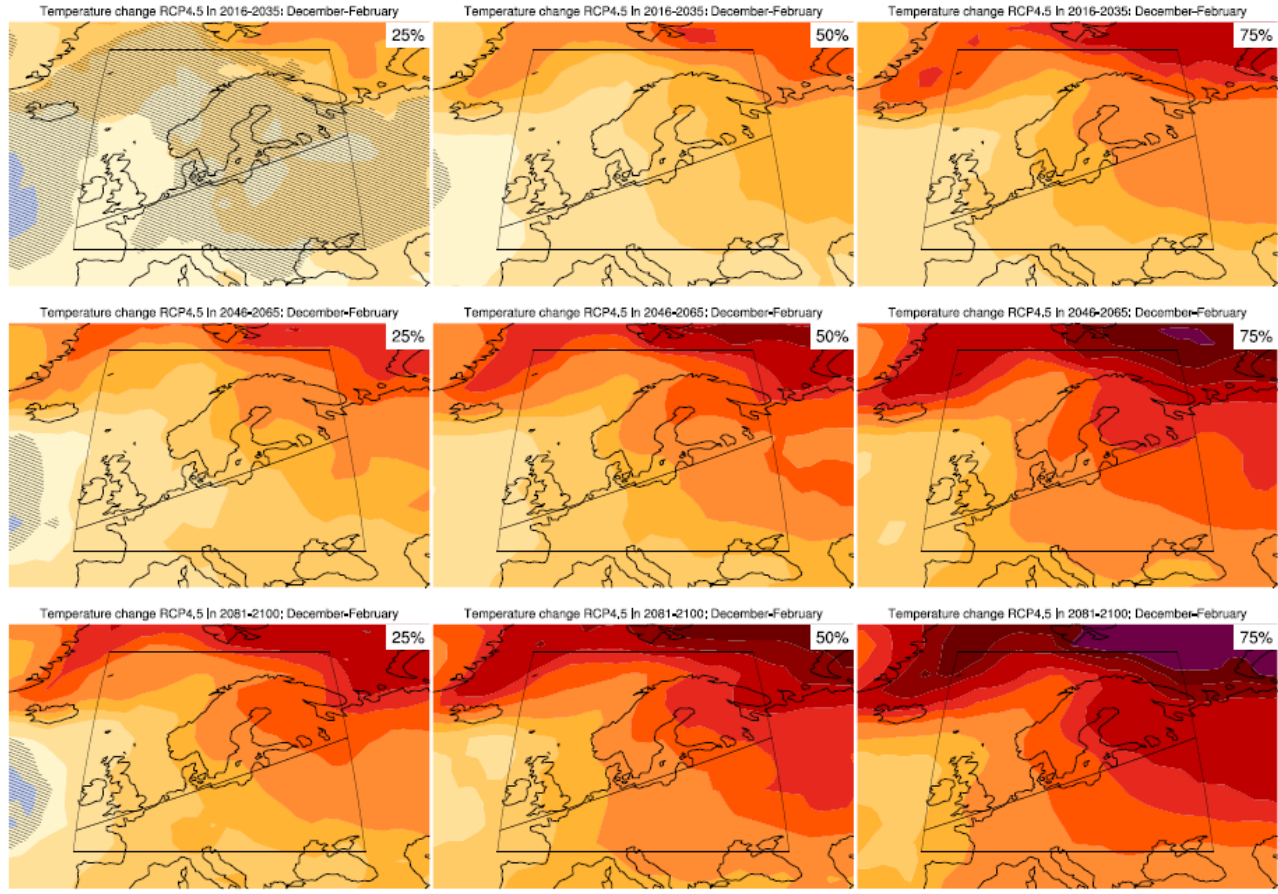
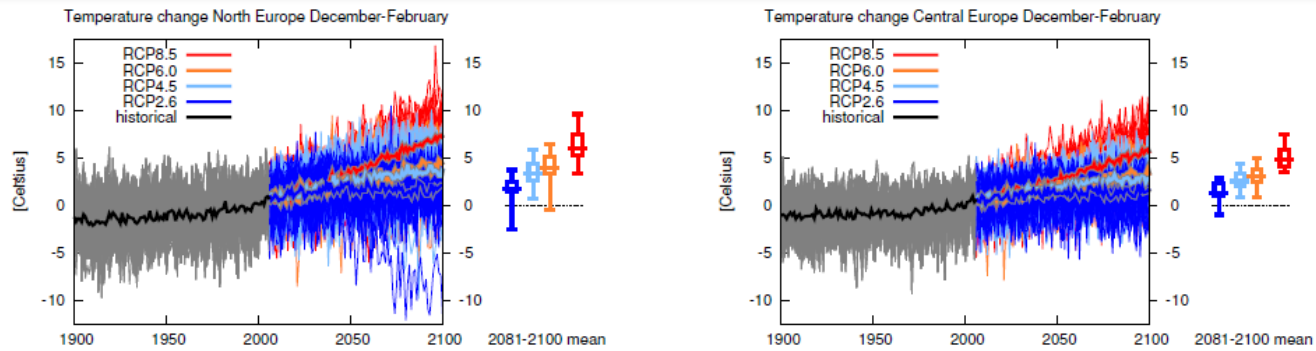


# Annex I: Atlas of Global and Regional Climate Projections

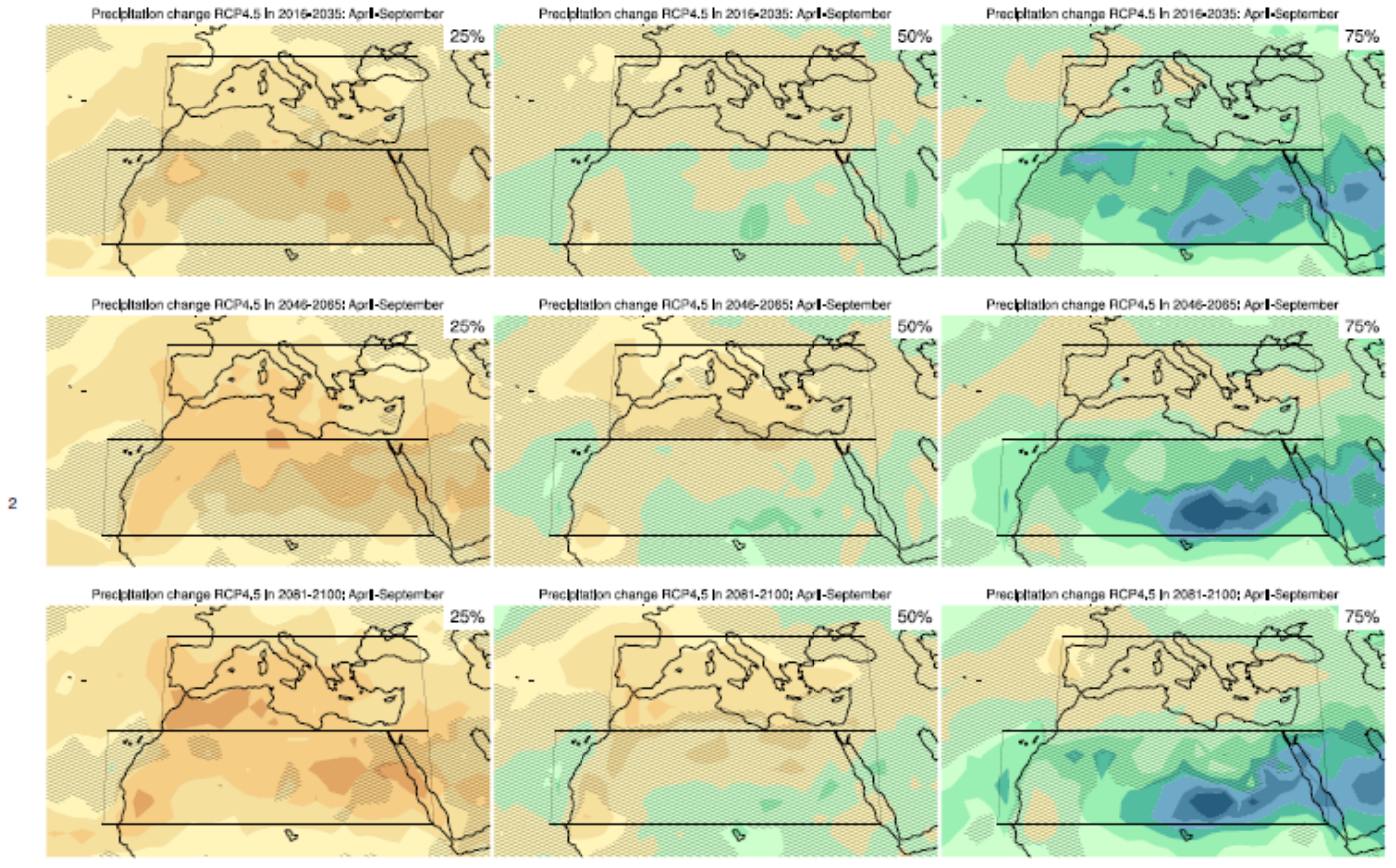
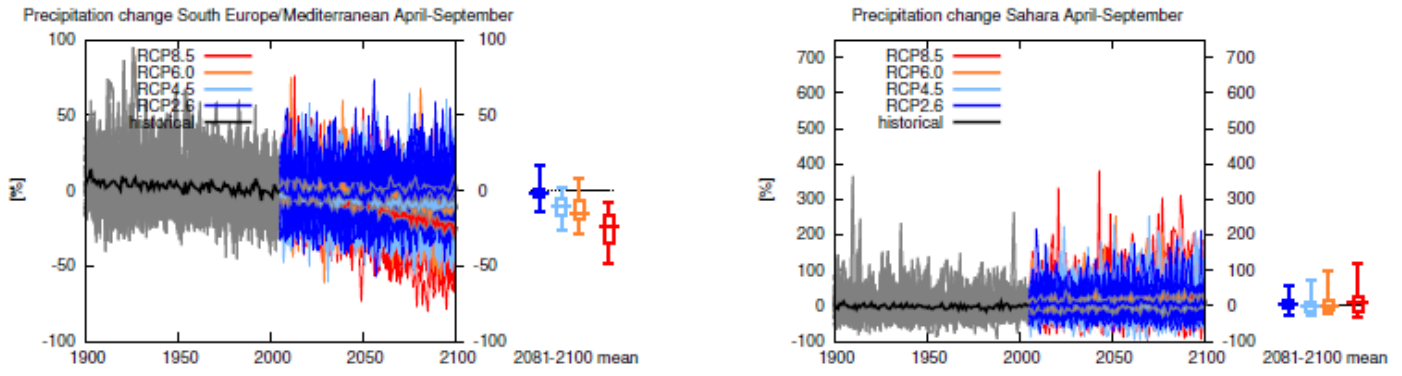
35 Regions



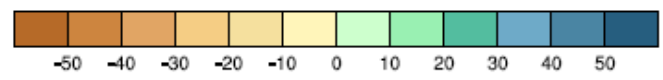
- **42 global climate models**
- **2 variables** (Winter/Summer)  
Temperature, Precipitation
- **4 scenarios**
- **Maps for 3 time horizons**  
2016-35, 2046-65, 2081-2100  
reference period 1986-2005



RCP4.5



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Further Information  
[www.climatechange2013.org](http://www.climatechange2013.org)

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