# Climate and Health Country Profiles

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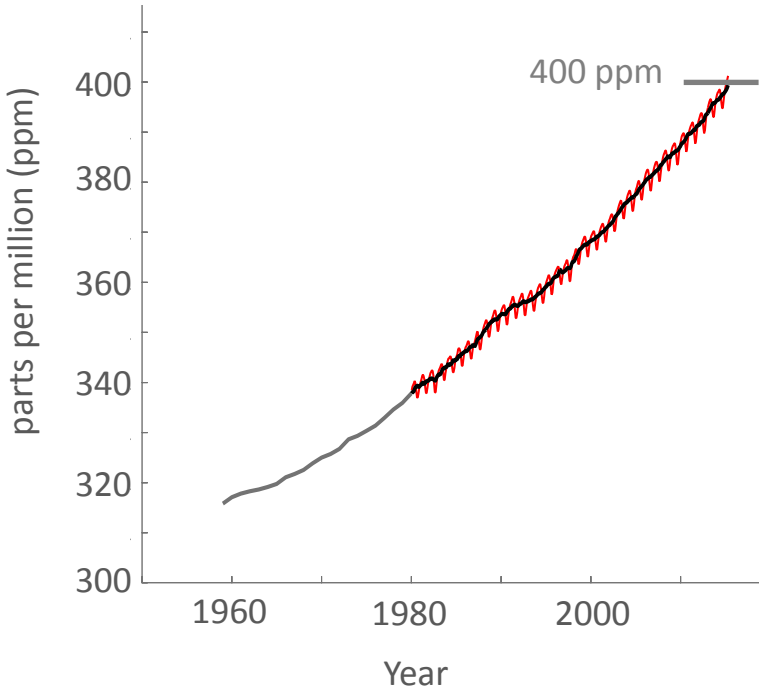
Special thanks to Clare Goodess and Colin Harpham,
Climatic Research Unit, UEA

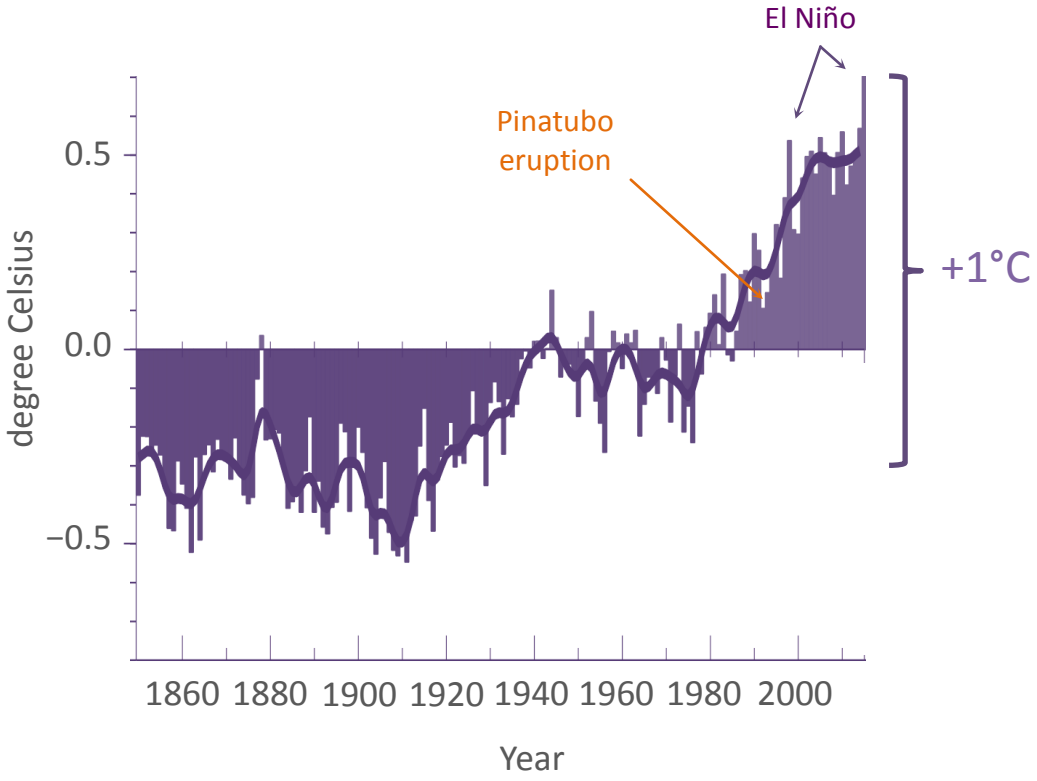
# Latest trends on atmospheric $CO_2$ and temperature

atmospheric $CO_2$ concentration



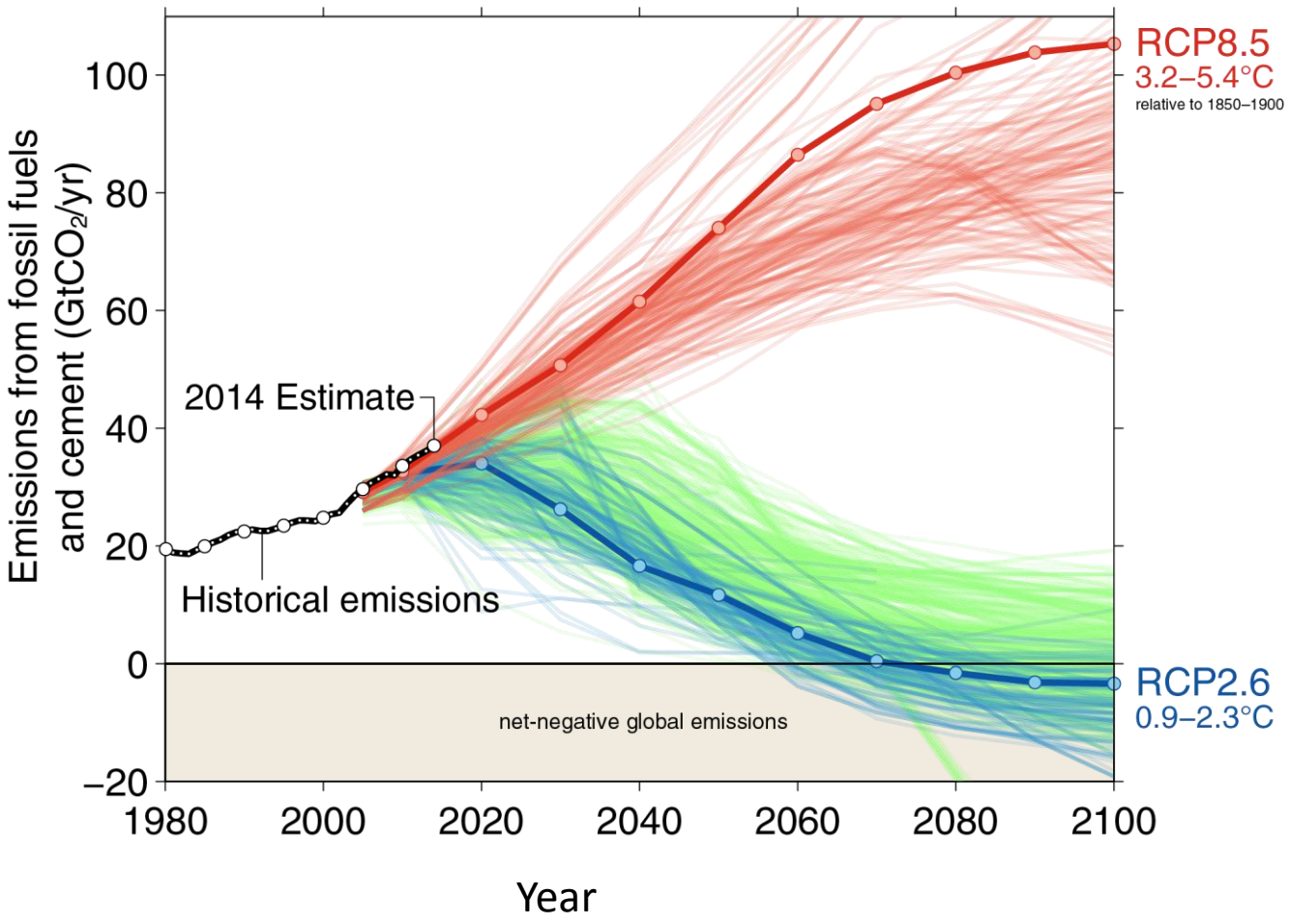

Data: Scripps/NOAA-ESRL

global temperature




Data: HadCRUT4

# Emissions need to decrease to near zero to achieve climate stabilisation




high-risk climate future

consistent with 2°C limit

Source: Fuss et al 2014; CDIAC; Global Carbon Budget 2014; IPCC WGI & WGIII scenario database

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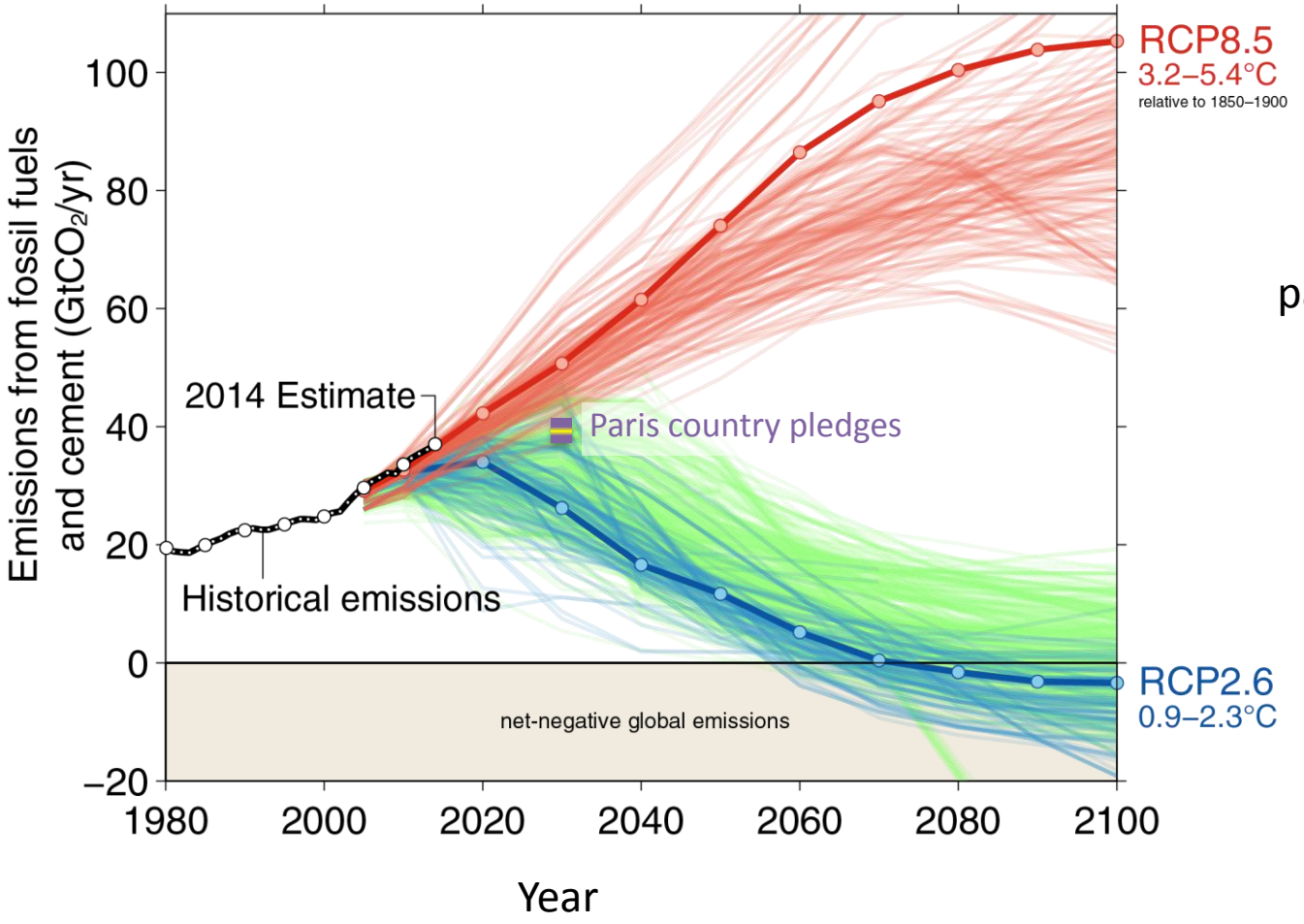


high-risk climate future

pathways consistent with countries INDC before Paris COP21

Source: growth above 2010 from UNFCCC

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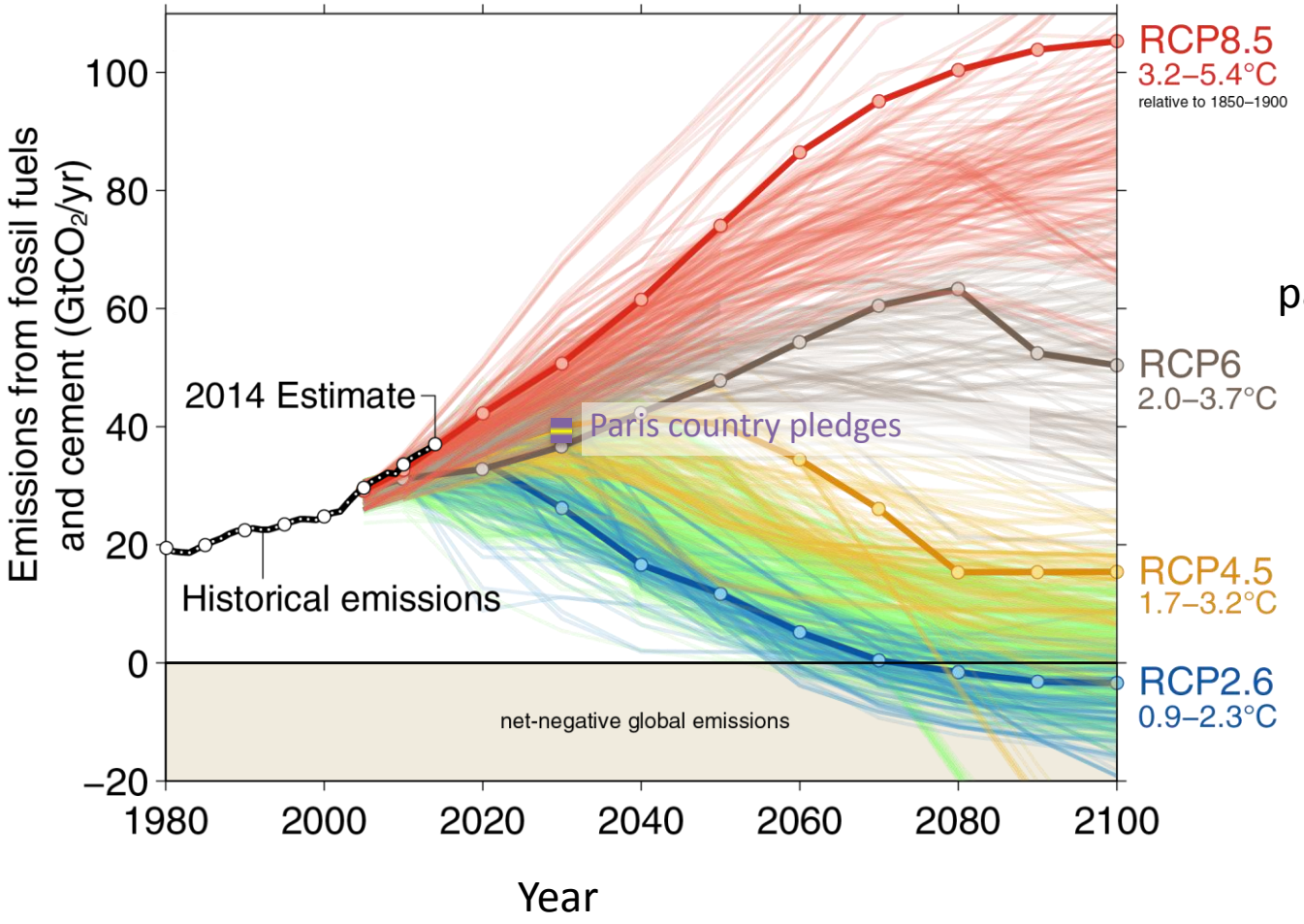


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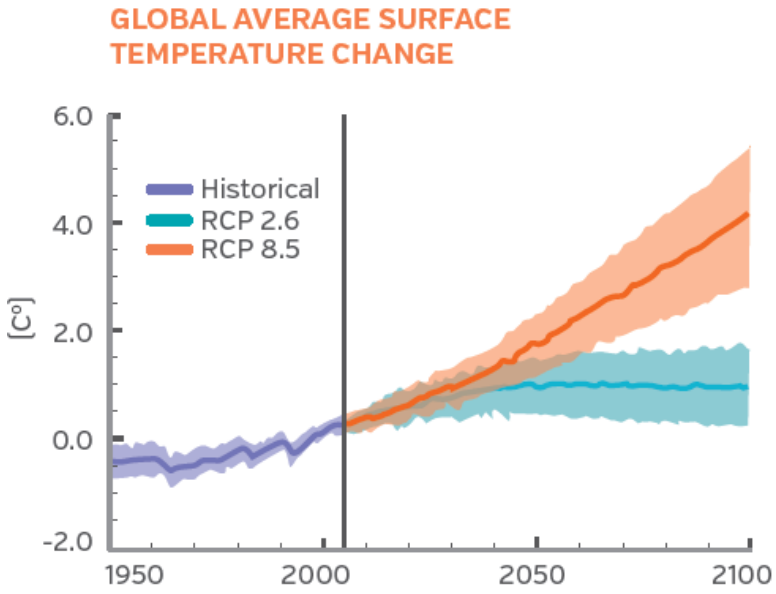
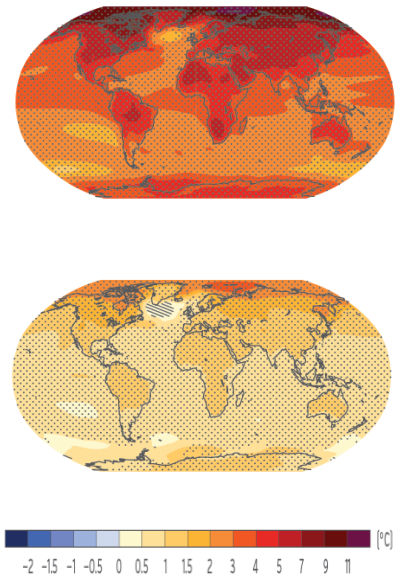
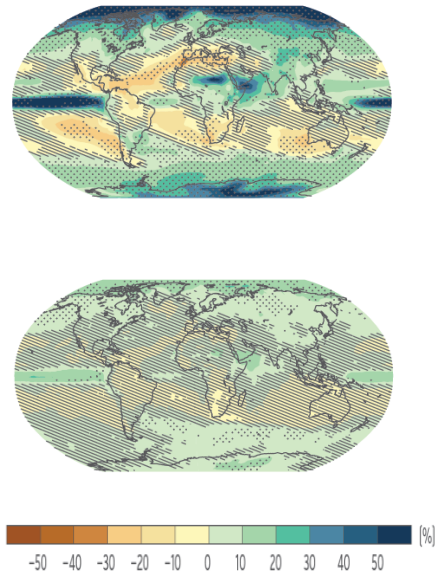
# What do climate projections mean for us?




temperature change




precipitation change




most hazards caused by climate change will persist for many centuries

Source: IPCC WGI

# What do climate projections mean for us?

warm spells

heavy precipitation

extreme high sea level

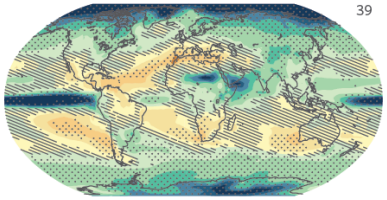
| Phenomenon and direction of trend | Assessment that changes occurred (typically since 1950 unless otherwise indicated) | Assessment of a human contribution to observed changes | Likelihood of further changes (Early 21st Century) | Likelihood of further changes (Late 21st Century) |
|---|---|---|---|---|
| Warmer and/or fewer cold days and nights over most land areas | Very likely | Very likely | Likely | Virtually certain |
| Warmer and/or more frequent hot days and nights over most land areas | Very likely | Very likely | Likely | Virtually certain |
| Warm spells/heat waves. Frequency and/or duration increases over most land areas | Medium confidence on a global scale - Likely in large parts of Europe, Asia and Australia | Likely | Not formally assessed | Very likely |
| Heavy precipitation events. Increase in the frequency, intensity, and/or amount of heavy precipitation | Likely more land areas with increases than decreases | Medium confidence | Likely over many land areas | Very likely over most of the mid-latitude land masses and over wet tropical regions |
| Increases in intensity and/or duration of drought | Low confidence on a global scale - Likely changes in some regions | Low confidence | Low confidence | Likely (medium confidence) on a regional to global scale |
| Increases in intense tropical cyclone activity | Low confidence in long term (centennial) changes - Virtually certain in North Atlantic since 1970 | Low confidence | Low confidence | More likely than not in the Western North Pacific and North Atlantic |
| Increased incidence and/or magnitude of extreme high sea level | Likely (since 1970) | Likely | Likely | Very likely |

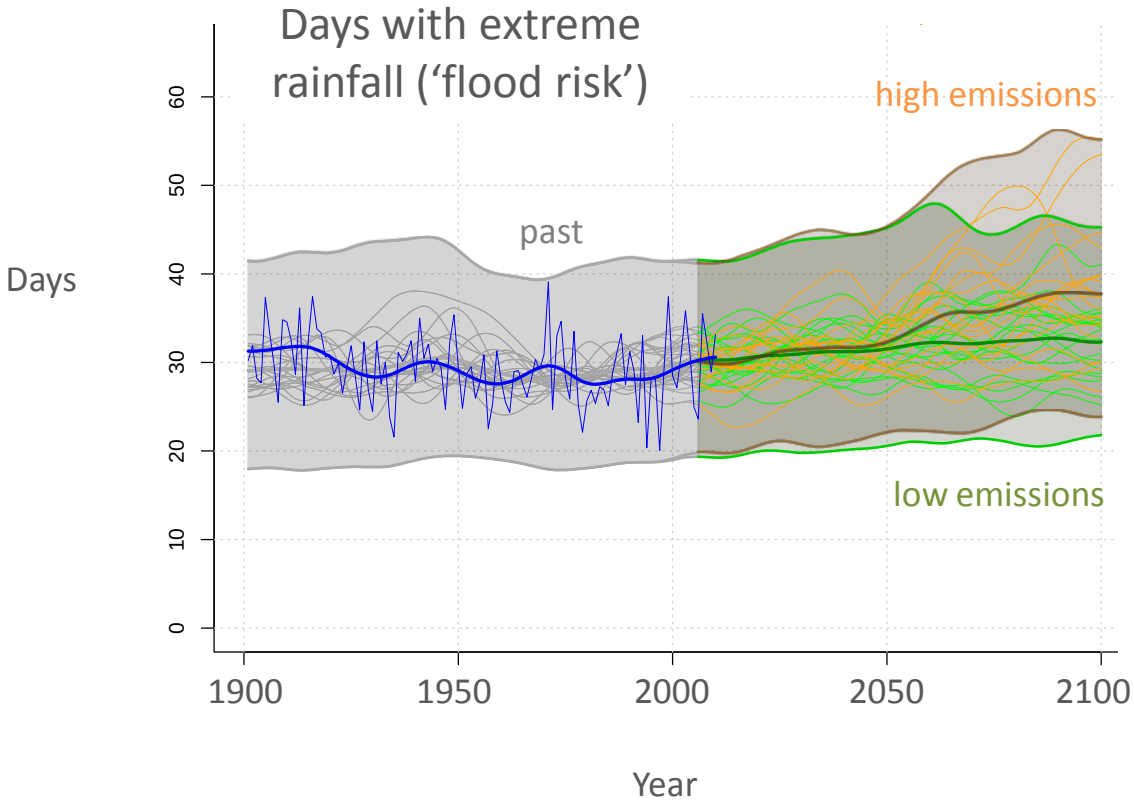
past and projected changes in extreme weather events

Source: IPCC WGI

# Providing evidence to inform country decisions

processing of the data and model projections
example of Bangladesh




1. Bangladesh average from ~20 models
2. Bias correction of mean using observations
3. 30 year smooth to remove natural variability
4. Observations to 2010 (for extremes) or 2013 (for mean T)
5. Consistency check

Source: data from HadEX2; model results from Sillmann et al 2013 based on CMIP5 model archive used by IPCC WGI

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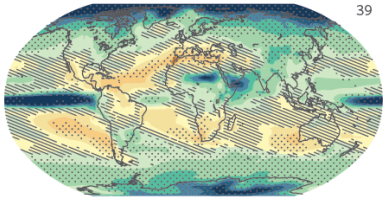


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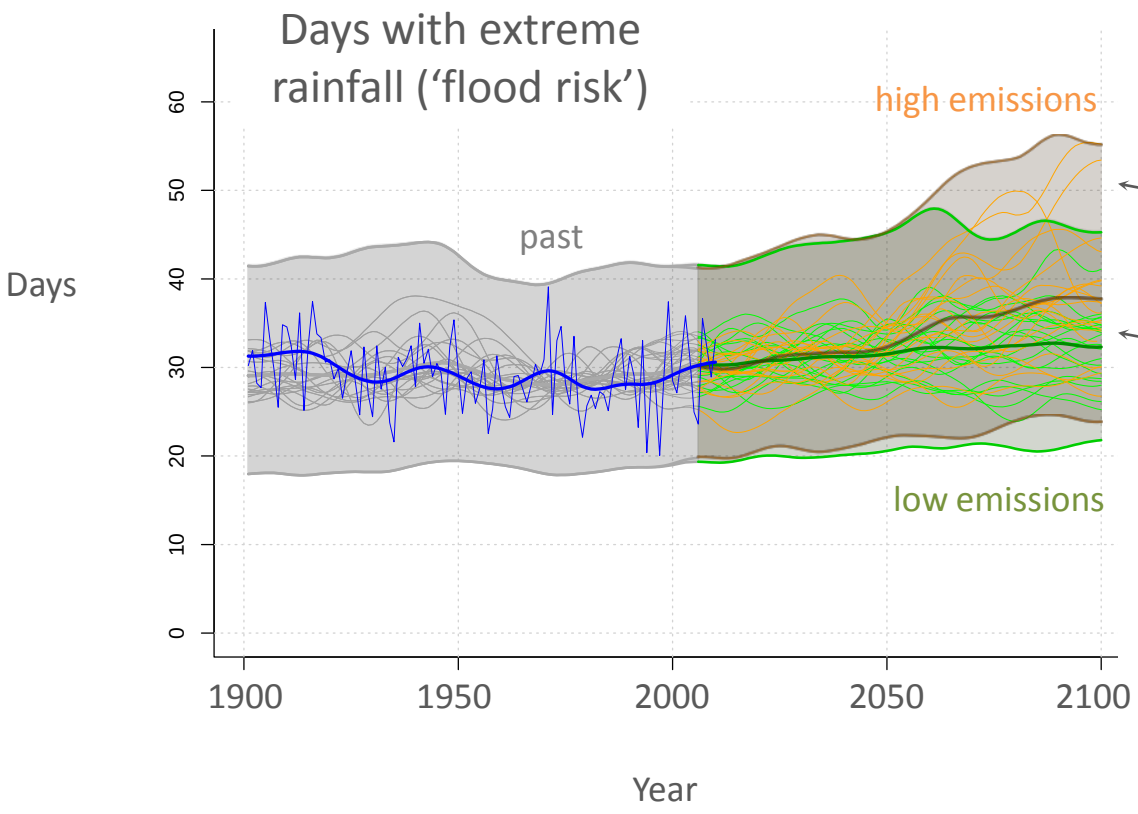


Increase in heavy rainfall days above natural variability

Increase in heavy rainfall days within natural variability

Source: data from HadEX2; model results from Sillmann et al 2013 based on CMIP5 model archive used by IPCC WGI

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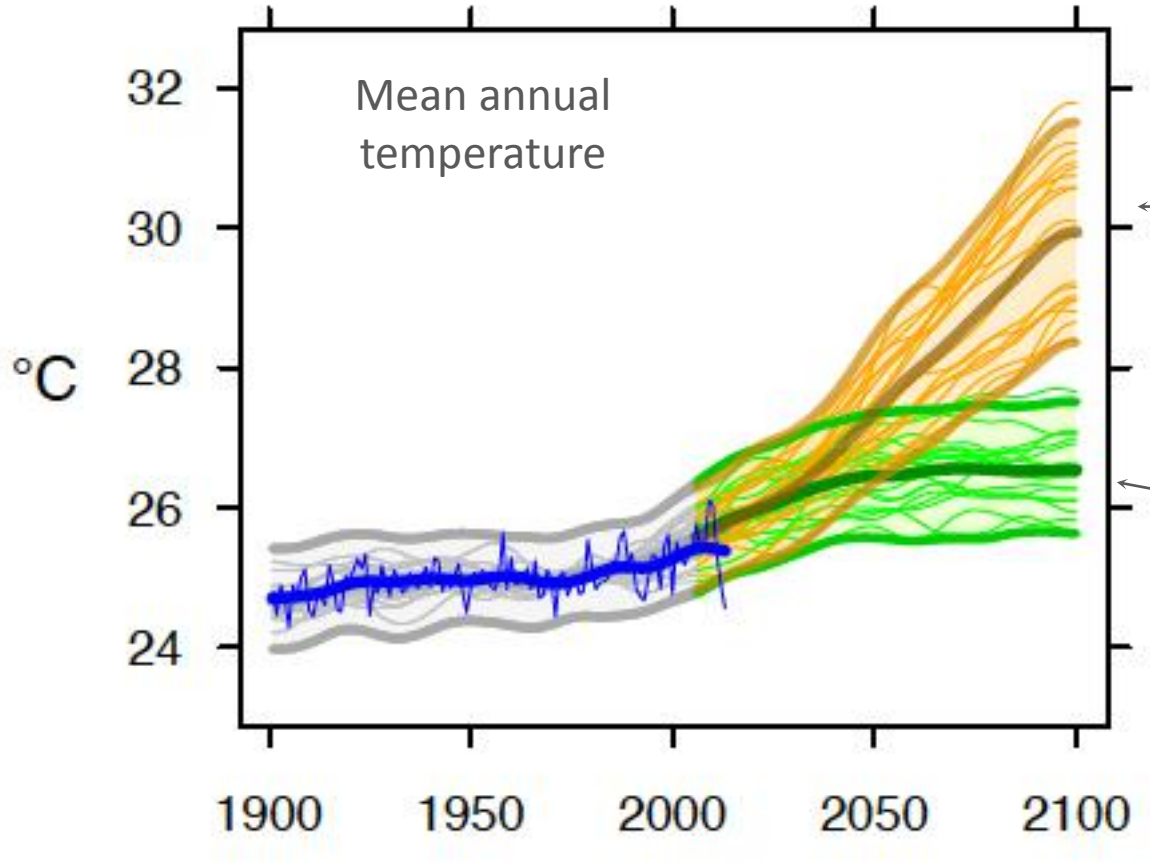
example of Bangladesh




mean projected warming of 4.8°C above 1990

mean projected warming of 1.4°C above 1990

Source: data from CRU-TSv3.22; model results from CMIP5 model archive used by IPCC WGI

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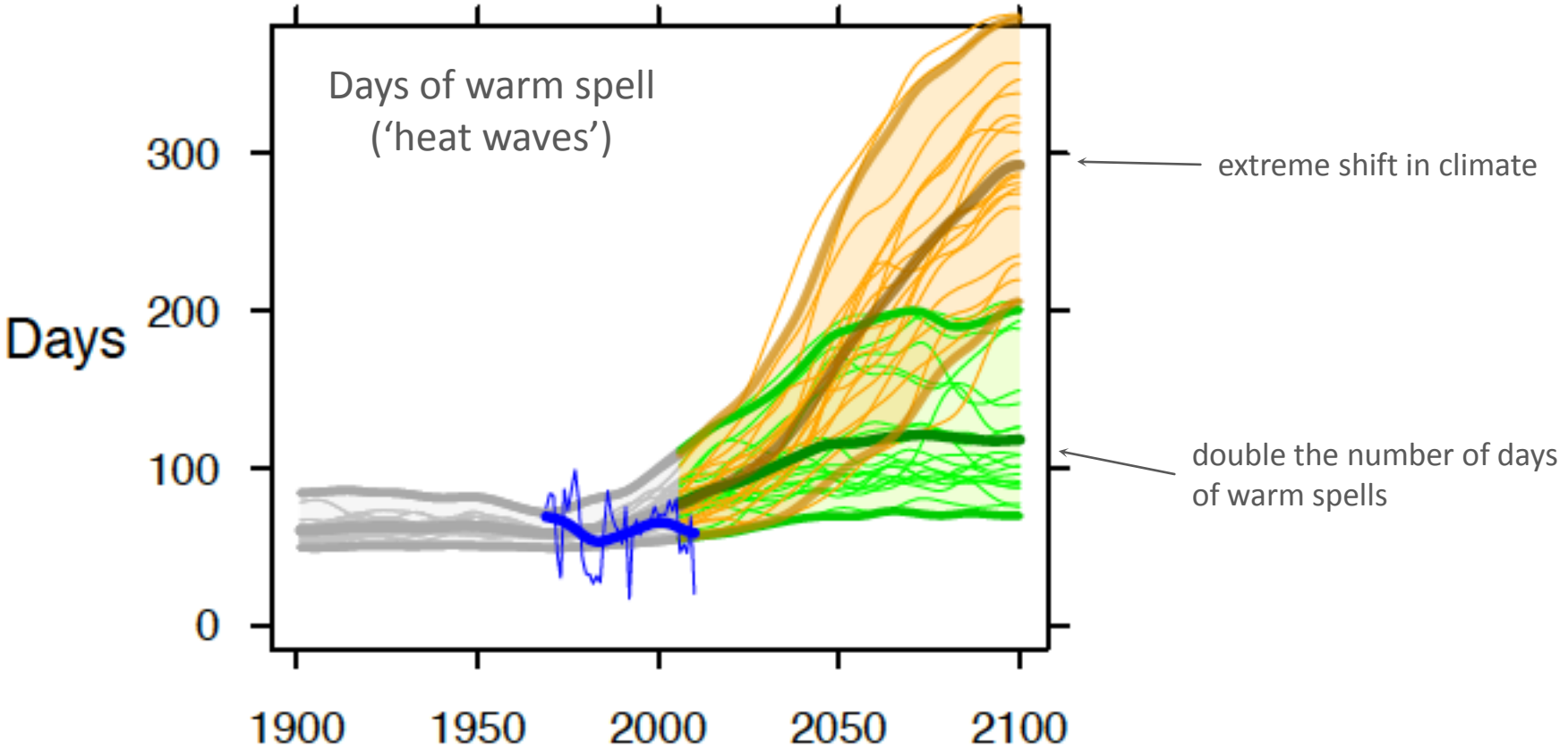
example of Bangladesh

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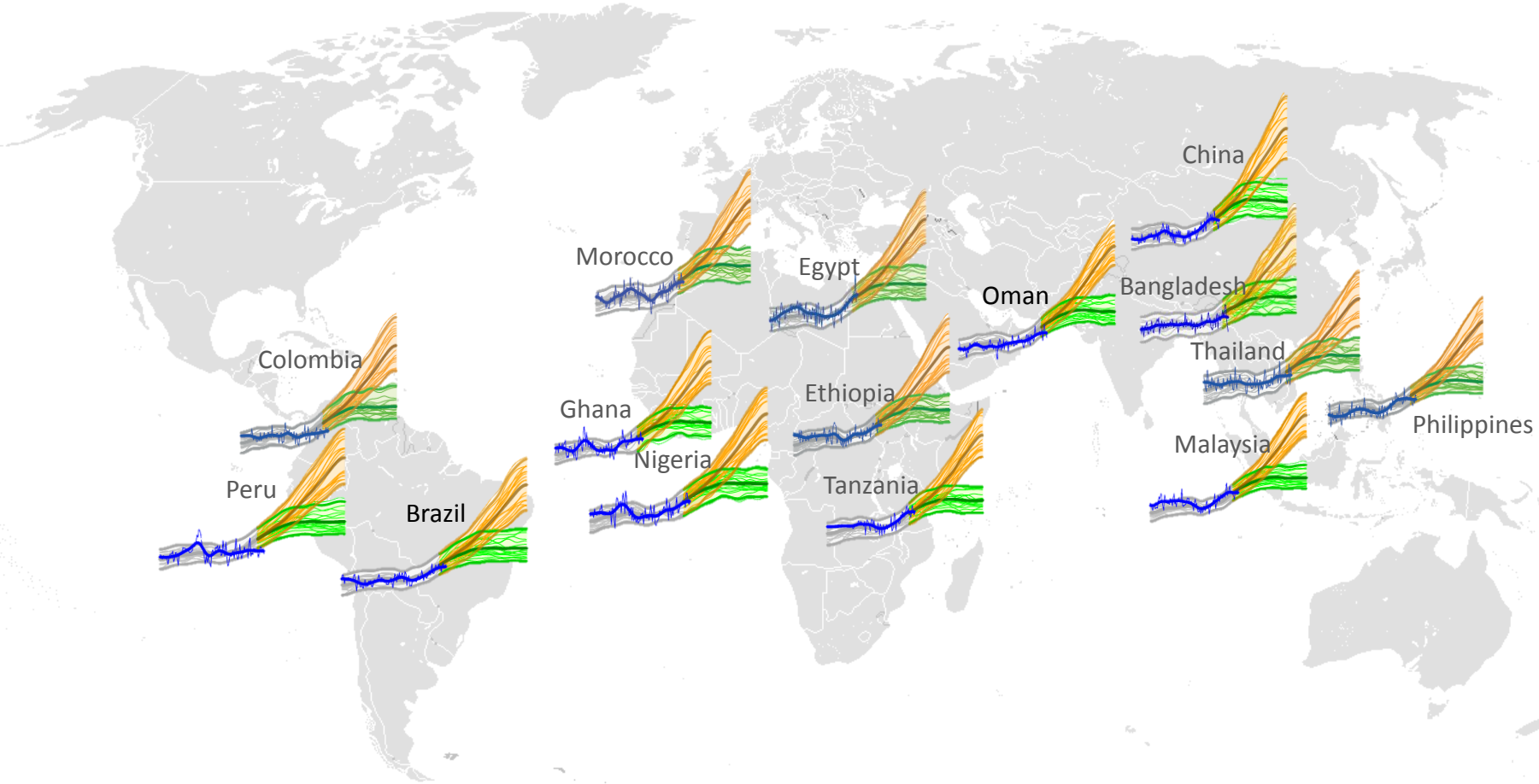
# Your country in perspective




mean annual temperature

data and model projections with high and low emissions

Source: data from CRU-TSv3.22; model results from CMIP5 model archive used by IPCC WGI

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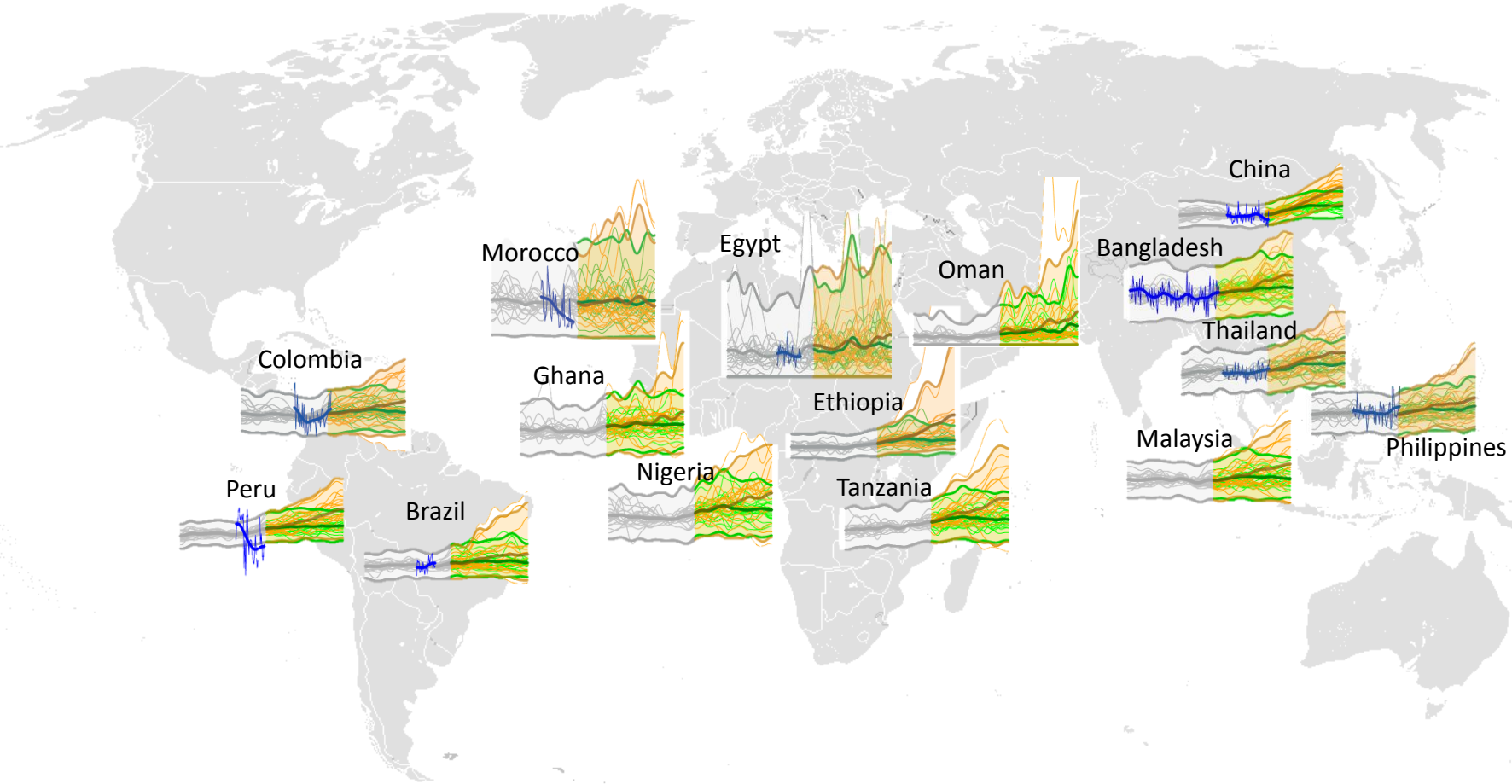


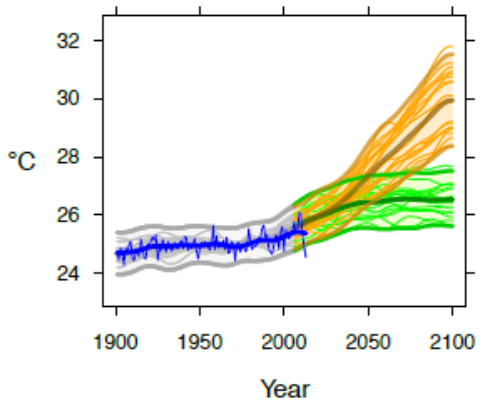

days with extreme rainfall

data and model projections with high and low emissions

Source: data from HadEX2; model results from Sillmann et al 2013 based on CMIP5 model archive used by IPCC WGI

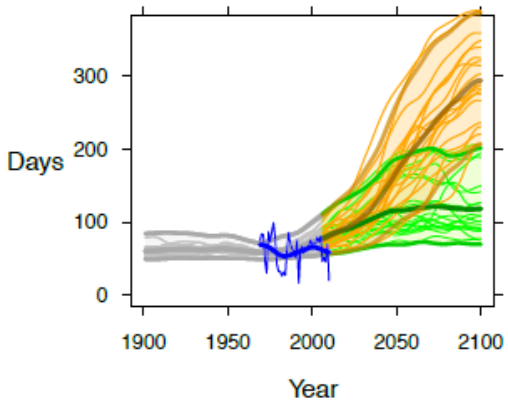
# 1 CURRENT AND FUTURE CLIMATE HAZARDS

## MEAN ANNUAL TEMPERATURE



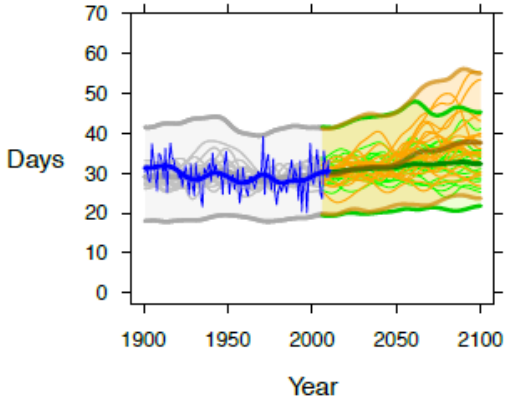

Under a high emissions scenario, mean annual temperature is projected to rise by about 4.8°C on average from 1990 to 2100. If emissions decrease rapidly, the temperature rise is limited to about 1.4°C.

## DAYS OF WARM SPELL ('HEAT WAVES')




Under a high emissions scenario, the number of days of warm spell[d] is projected to increase from about 60 days in 1990 to almost 300 days on average in 2100. If emissions decrease rapidly, warm spell days are limited to about 120 on average.

## DAYS WITH EXTREME RAINFALL ('FLOOD RISK')




## CONSECUTIVE DRY DAYS ('DROUGHT')