

Shifting patterns of mild weather in response to projected radiative forcing

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Mild weather ?!

Climate research:

- changes in mean conditions
- changes in extreme events

→ rare, difficult to relate to

Mild weather occurs regularly, has a positive connotation and impacts human activity

Criteria of mild weather

Neither too hot, too cold, too humid, nor rainy:

- Maximum daily temperature 18-30°C
- Daily total precipitation ≤ 1 mm
- Daily mean dewpoint temperature $\leq 20^\circ\text{C}$

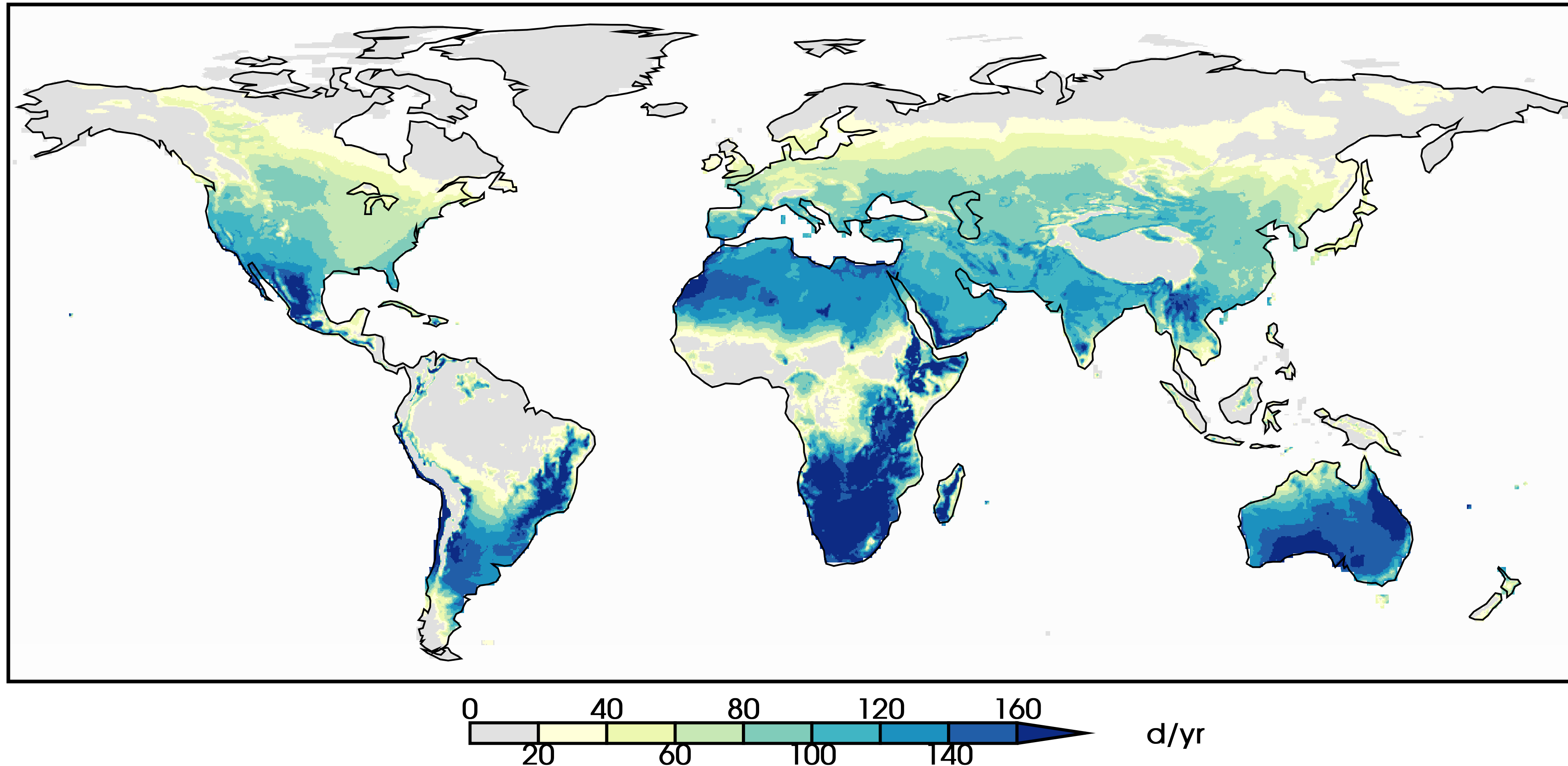
Model experiments

- GFDL HiFLOR
 - $0.25^{\circ} \times 0.25^{\circ}$ land and atmosphere
 - $1^{\circ} \times 1^{\circ}$ ocean and sea ice
 - SSTs restored to repeating climatology
- present-day 1986-2005
- RCP4.5 2016-2035 near-term projection
 2081-2100 long-term projection

Global distribution of mild weather

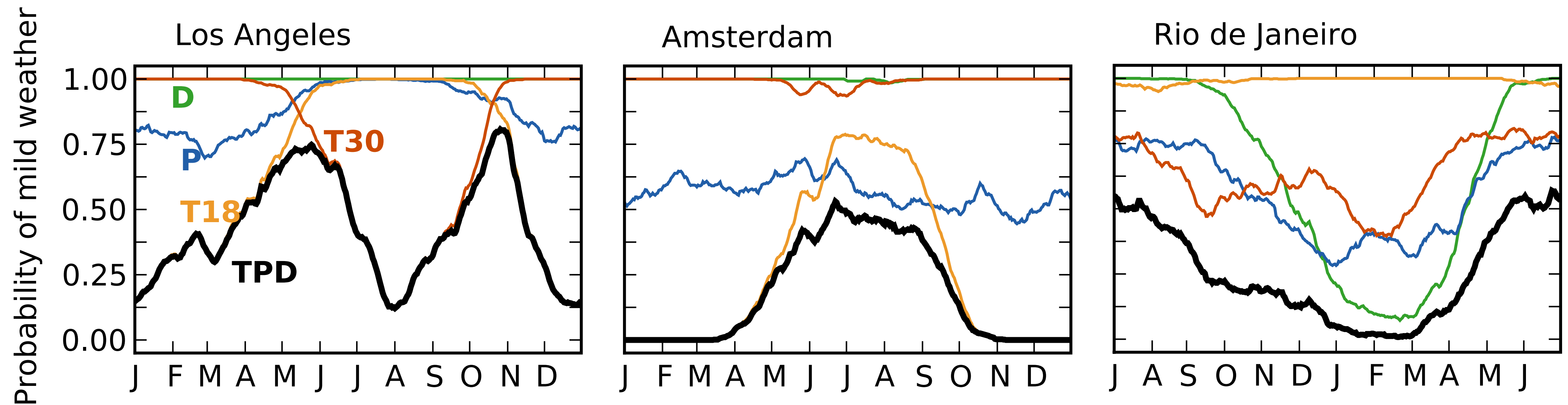
Annual number of mild days

mean: 74 d/yr per km²; 89 d/yr per person



Annual cycle of mild weather

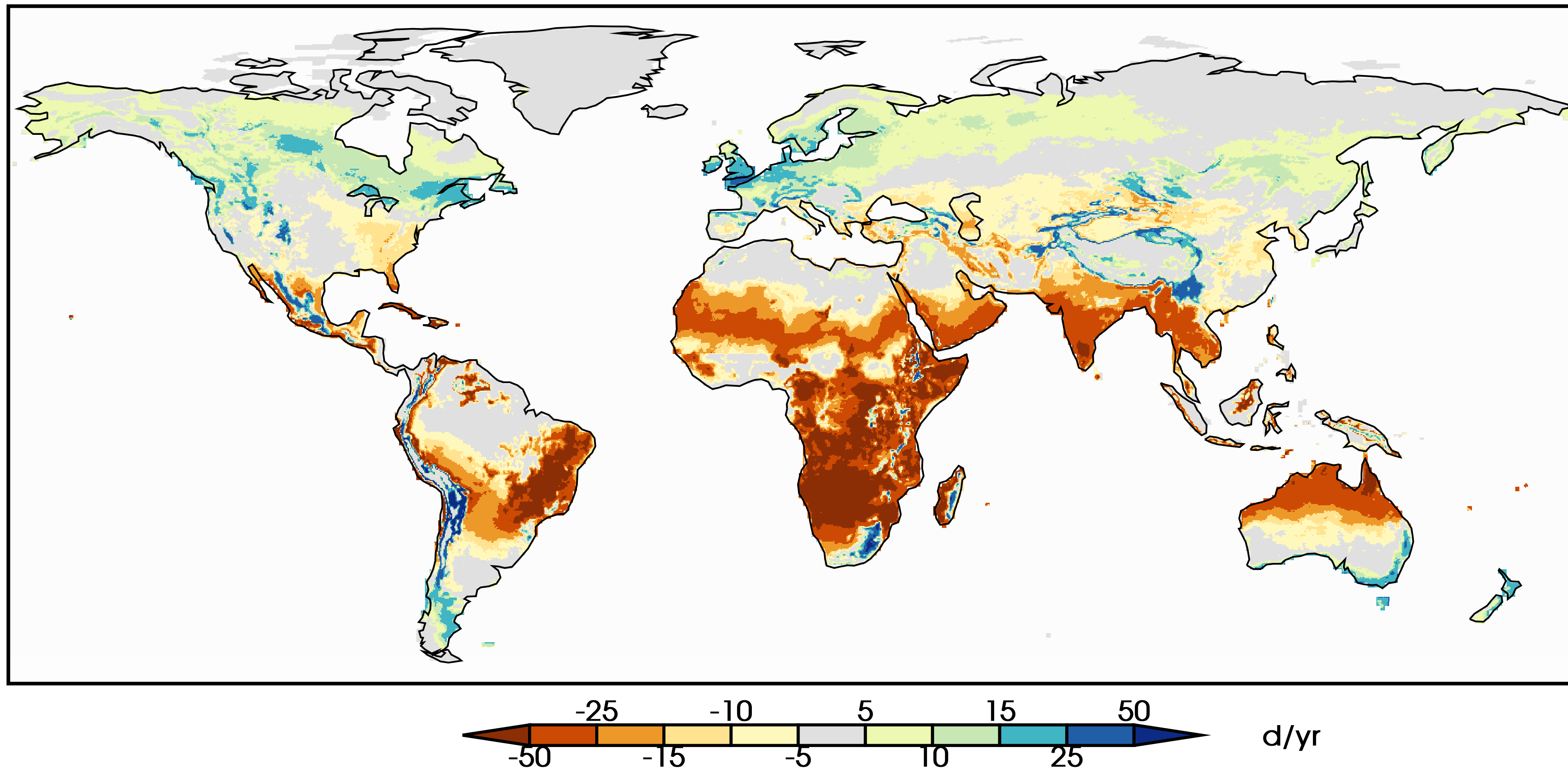
Probability of mild weather



Projected change (RCP4.5, 2081-2100)

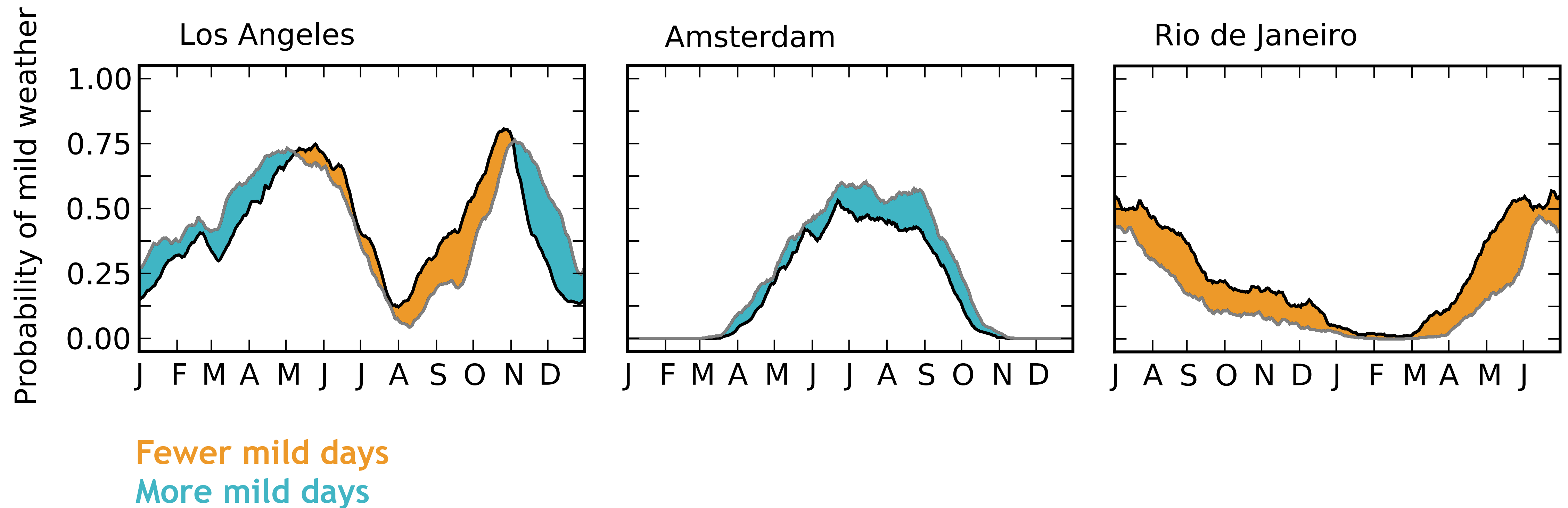
Change in the annual number of mild days

mean: -10 d/yr per km²; -11 d/yr per person



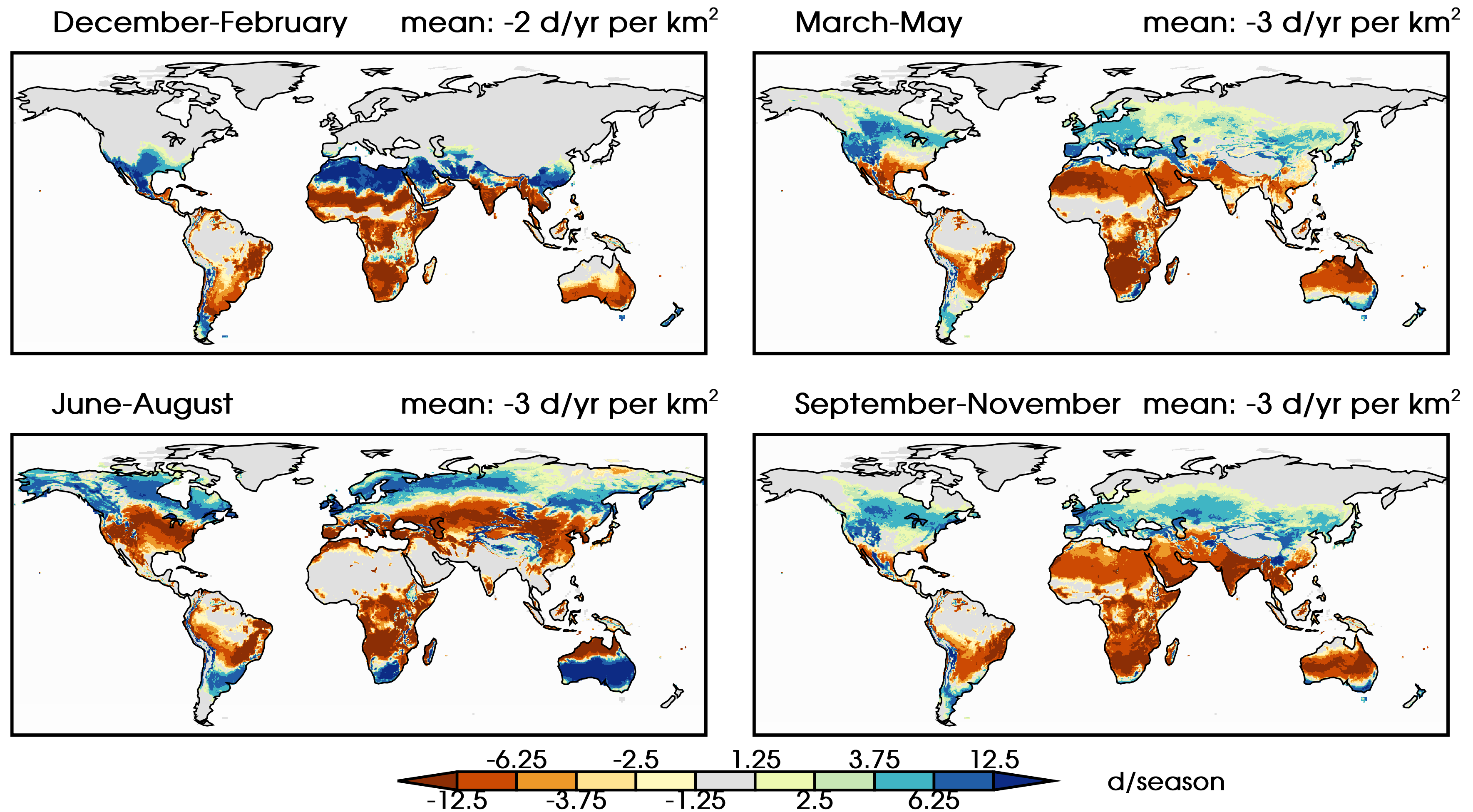
Projected change (RCP4.5, 2081-2100)

Change in the probability of mild weather



Seasonal shifts

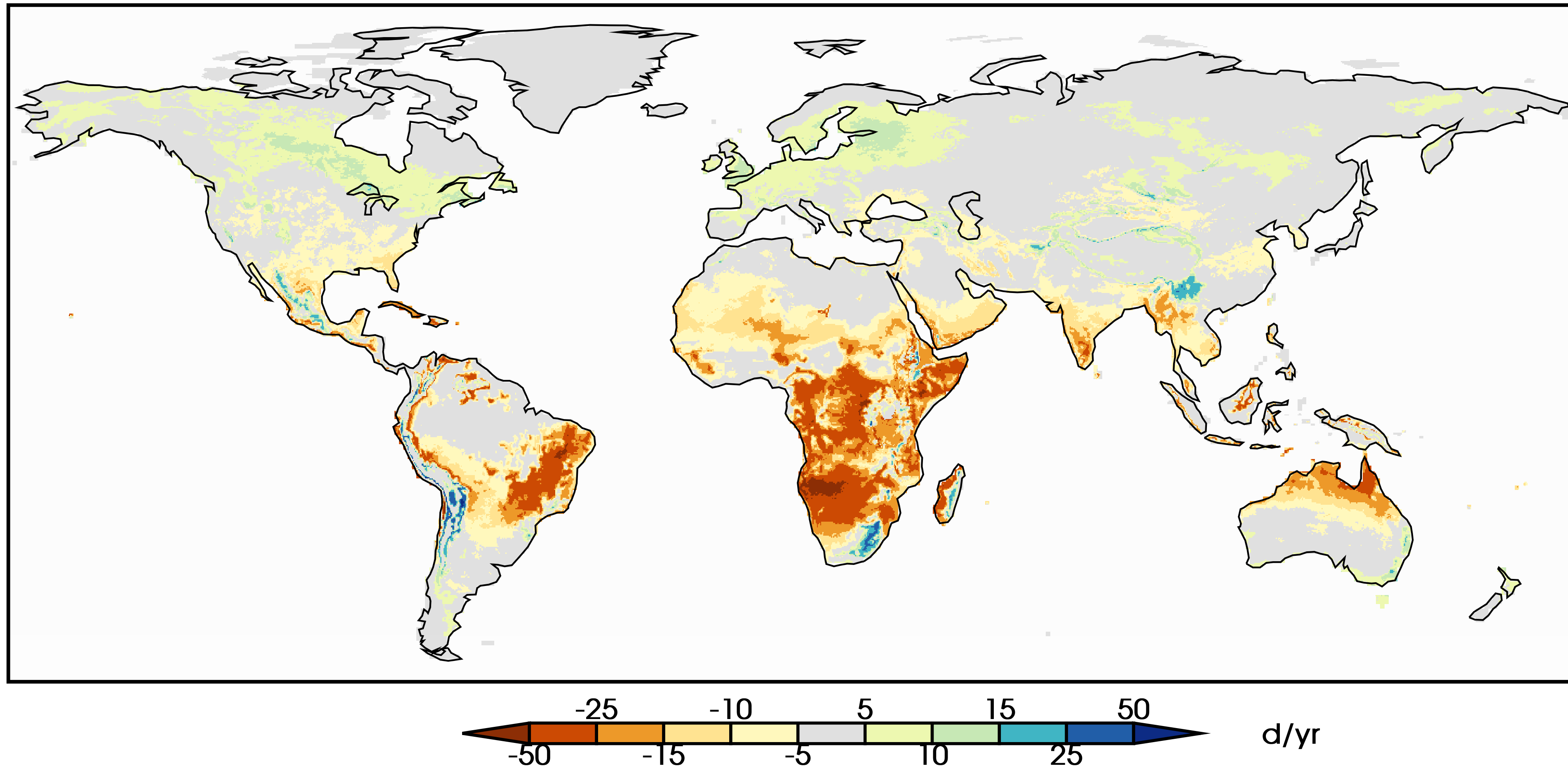
Change in the seasonal number of mild days



Near-term change (RCP4.5, 2016-2035)

Change in the annual number of mild days

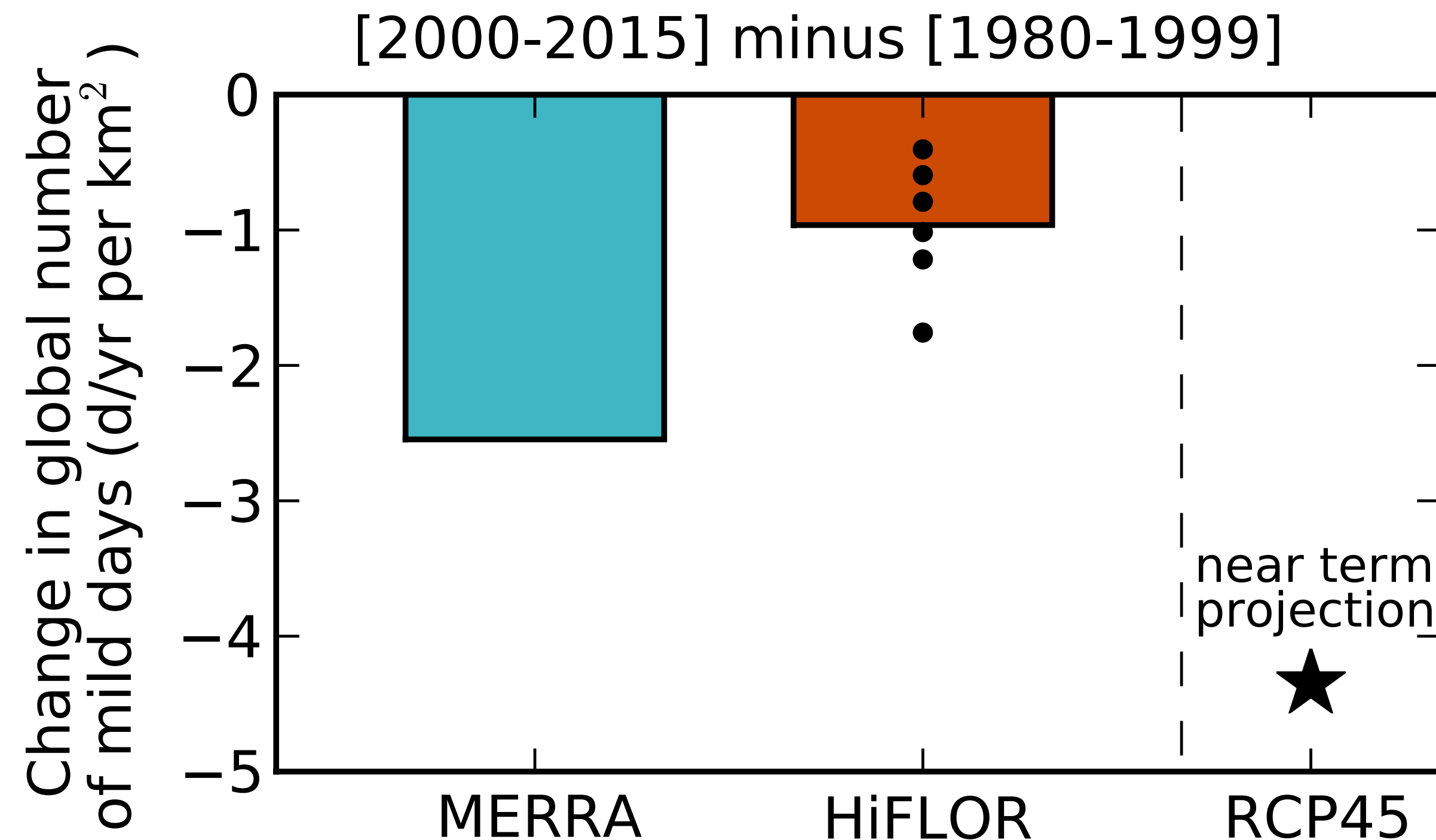
mean: -4 d/yr per km²; -4 d/yr per person



Observed change in recent past

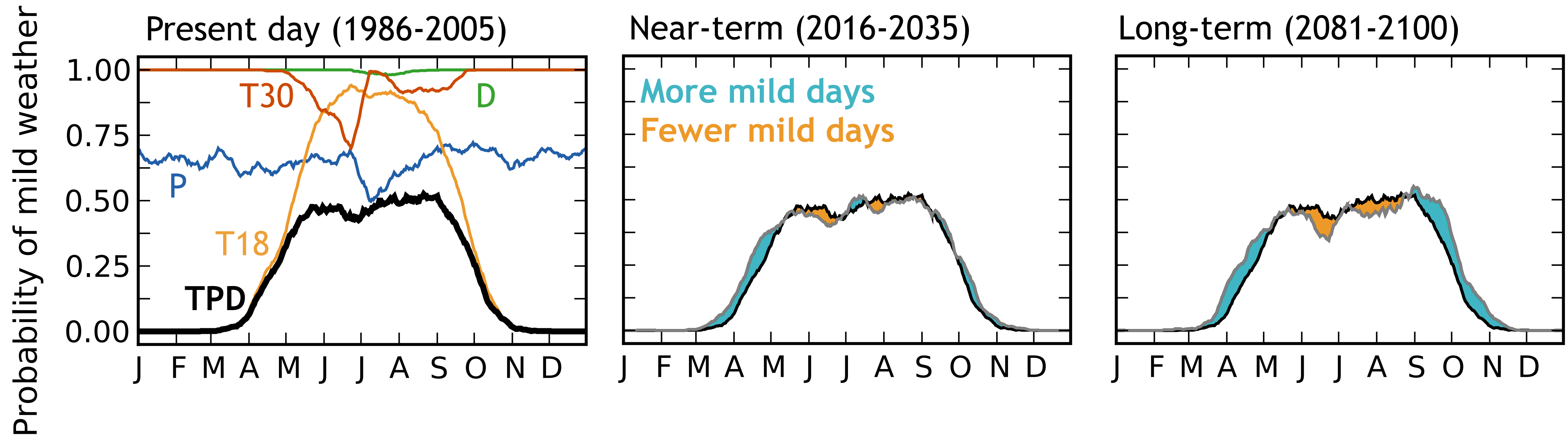
Change in the annual number of mild days

- MERRA-2 reanalysis
- HiFLOR SST-restoring experiments, 6 ensemble members



Local, reliable climate information

Vienna:



Mild weather

- Highly relatable, important for human outdoor activity
→ should be investigated in more detail
- Global decrease: -4 days/year (2016-2035)
 -10 days/year (2081-2100)
- Local and seasonal changes much bigger

More information:

Van der Wiel et al. (2017): Shifting patterns of mild weather in response to projected radiative forcing, *Climatic Change*, 140, pp. 649-658.