



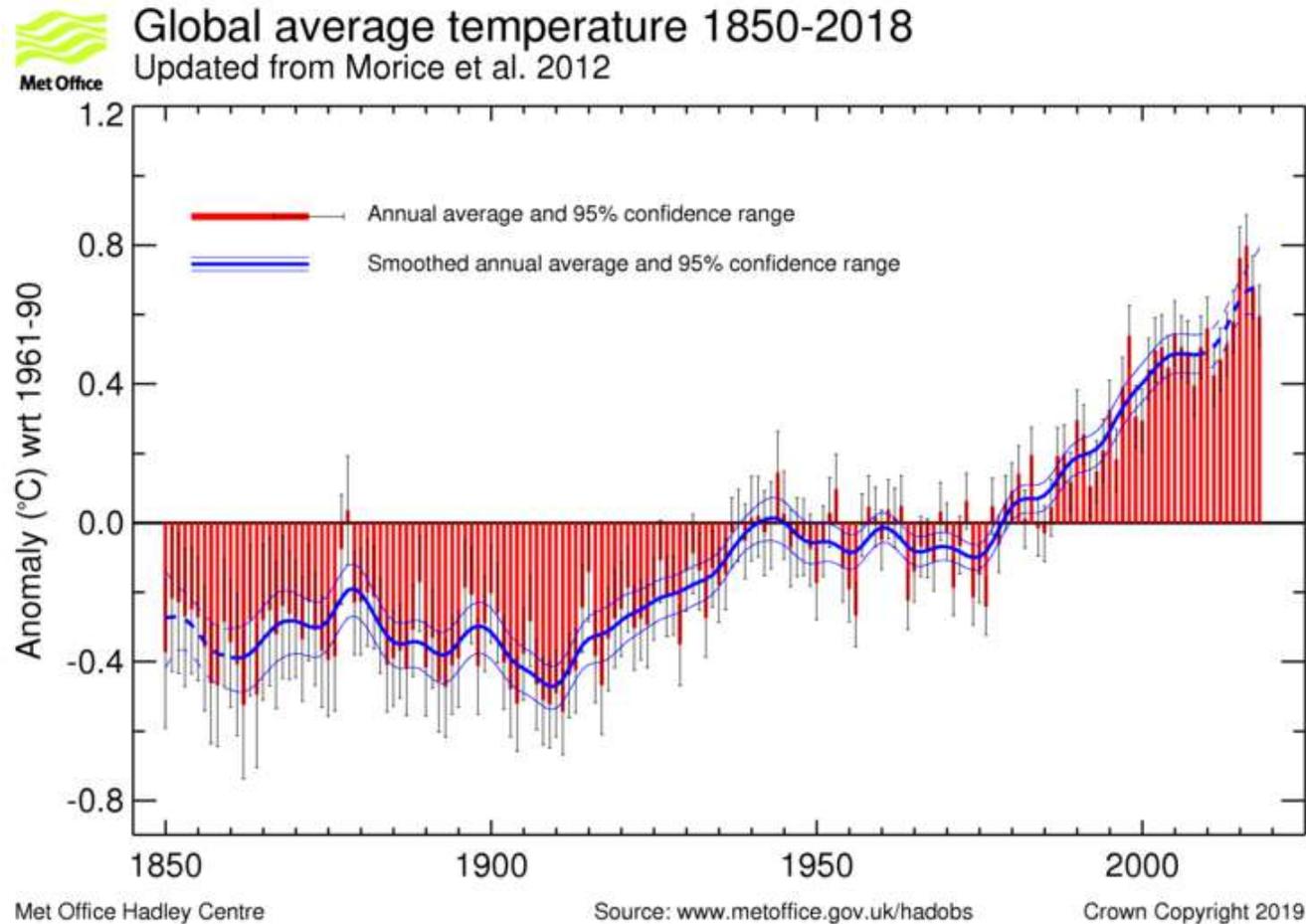
*Événements extrêmes et  
dégradation des terres*

*Prof. Dr. Wim Thiery*



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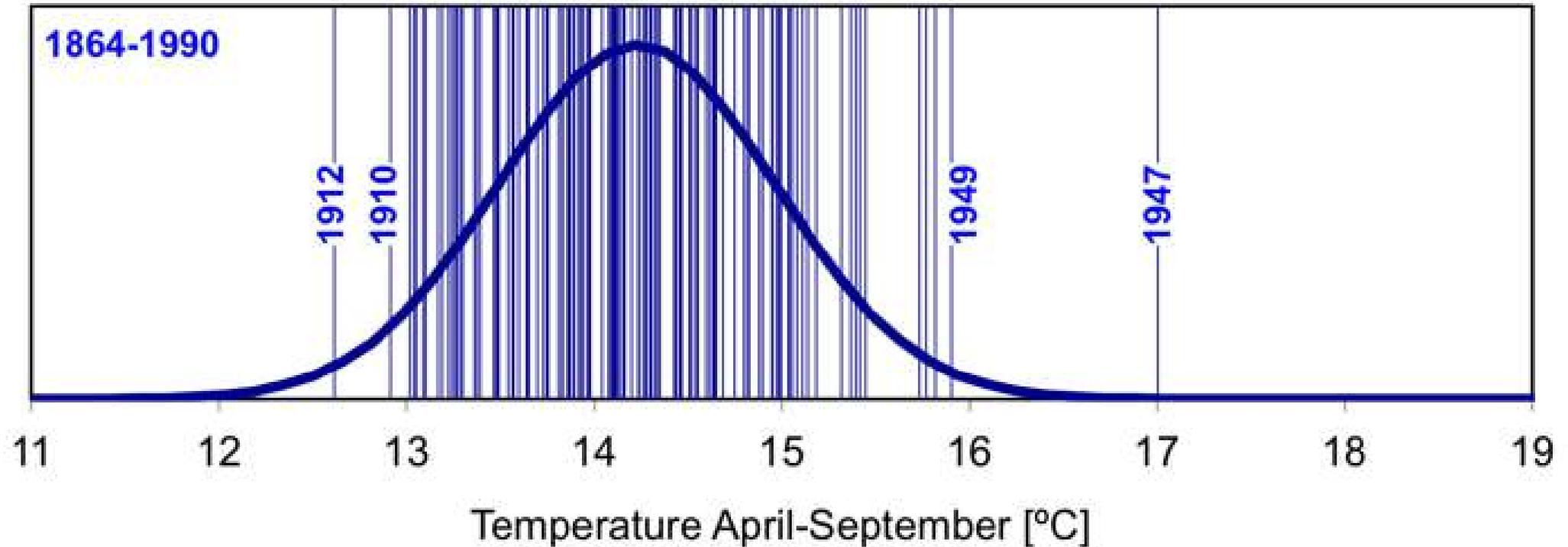
# Augmentation de la température moyenne globale



(UK MetOffice, 2019)

# Vivre dans un monde plus chaud de 1°C

## La Suisse comme exemple



Schär (ETH Zürich), based on MeteoSwiss data

# Vivre dans un monde plus chaud de 1°C

## Été 2019



**Texas**



**Californie**



**Groenland**



**Australie**

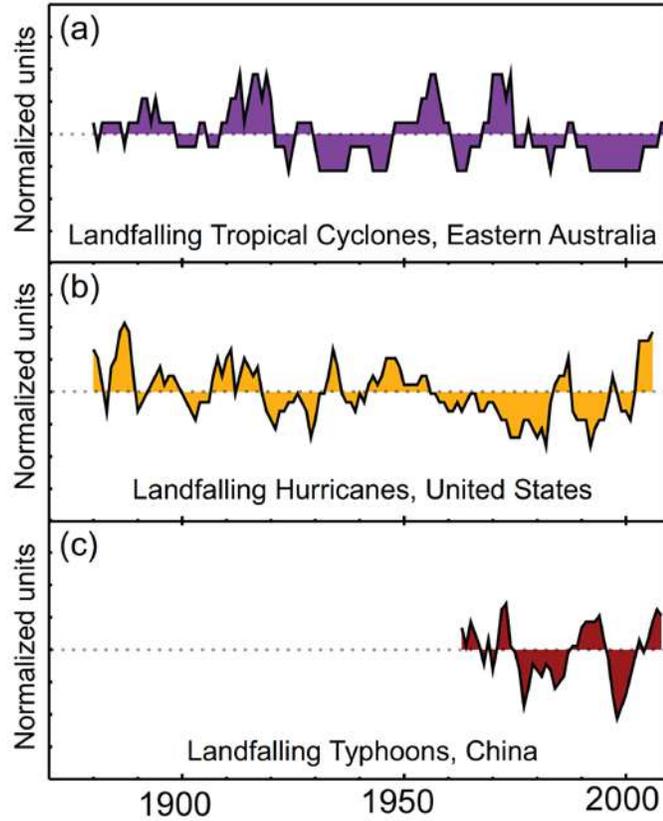


**France (Juin)**

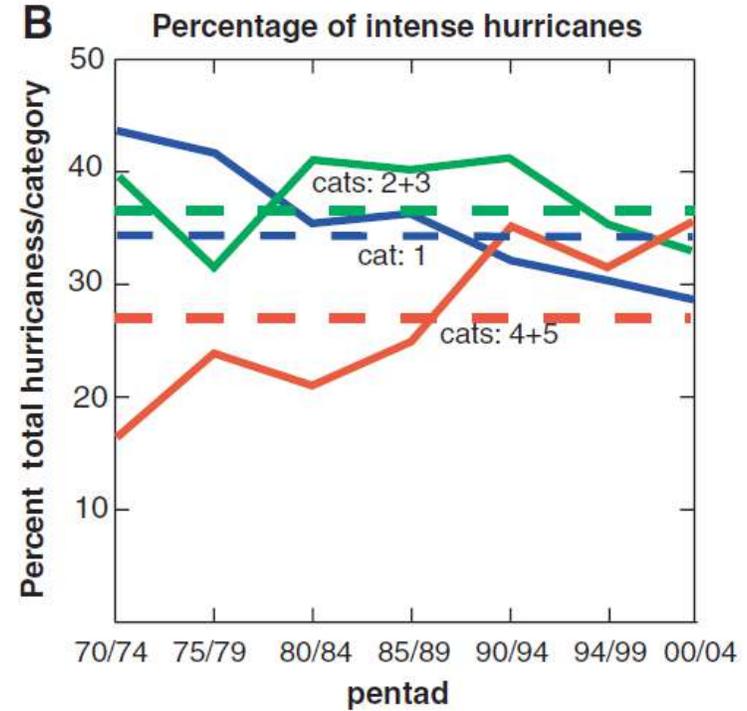


**France (Juillet)**

# Cyclones tropicaux



(IPCC, 2013: AR5)

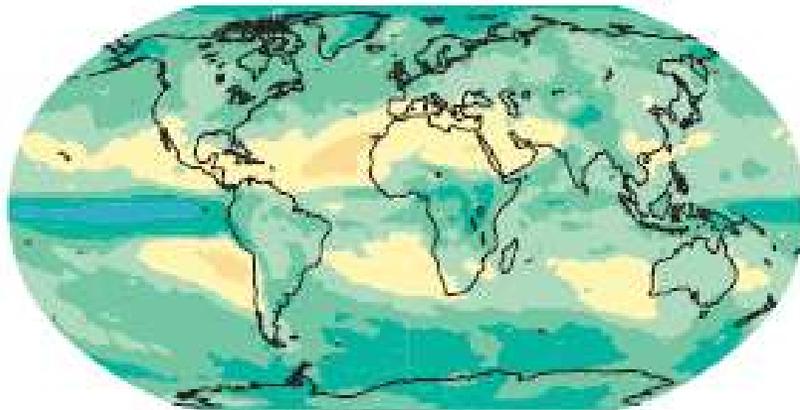


(Webster et al., 2005 Science)

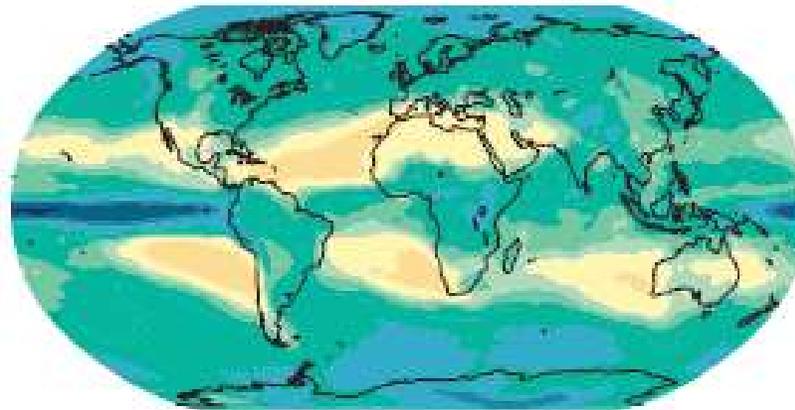
# Precipitations extrêmes

Pre-industrial 99th percentile of daily precipitation

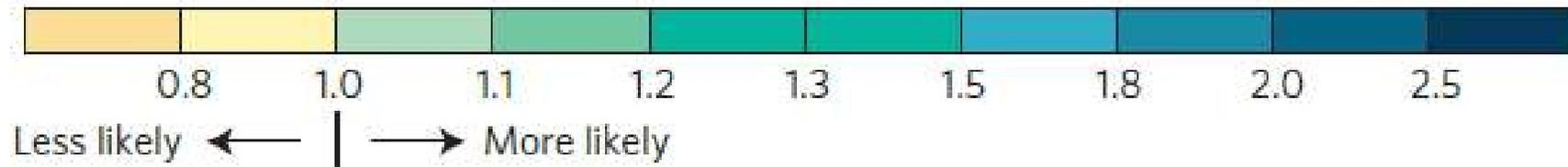
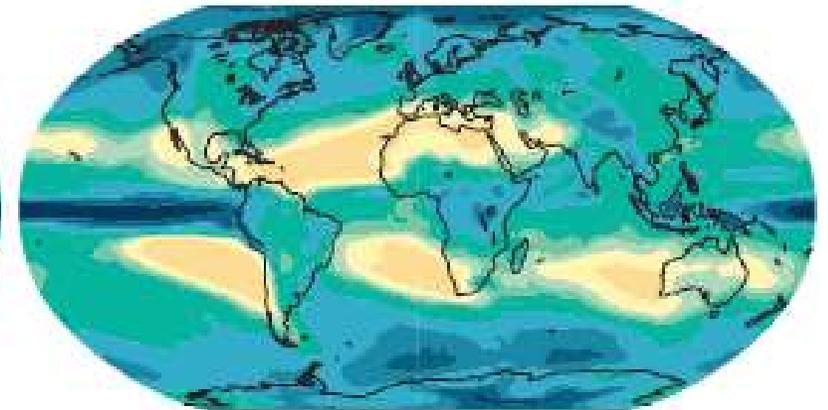
PR at present-day warming



PR at 2 °C warming

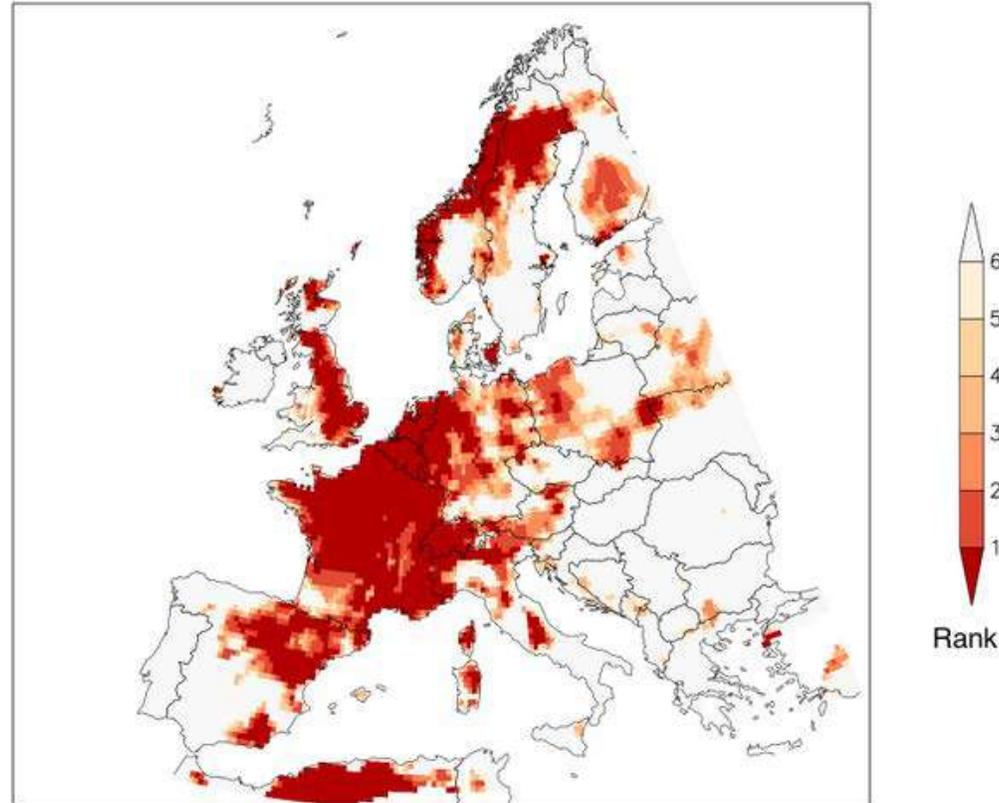


PR at 3 °C warming



(Fischer and Knutti, 2015 NCC)

# Canicules Été 2019



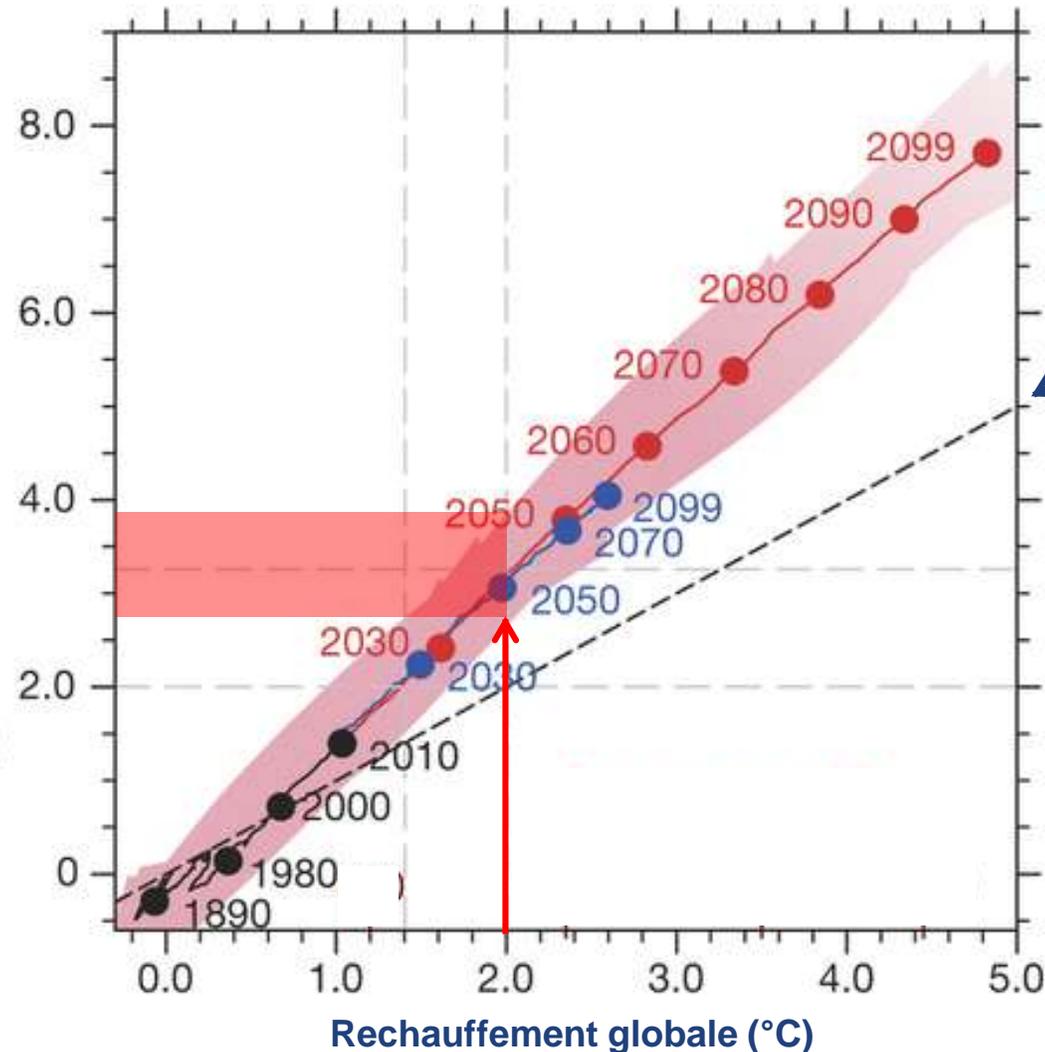
Rank of annual maximum temperatures observed in Europe in 2019 compared to 1950–2018, based on the E-OBS data set (Haylock et al., 2008, version 19, extended with monthly and daily updates to 30 July 2019). This figure is made with preliminary data and should be taken with caution as some measurements are not yet validated.

(WorldWeatherAttribution.org, 2019)

# Variabilité temporelle

2°C de réchauffement ne sera pas uniforme tout au long de l'année

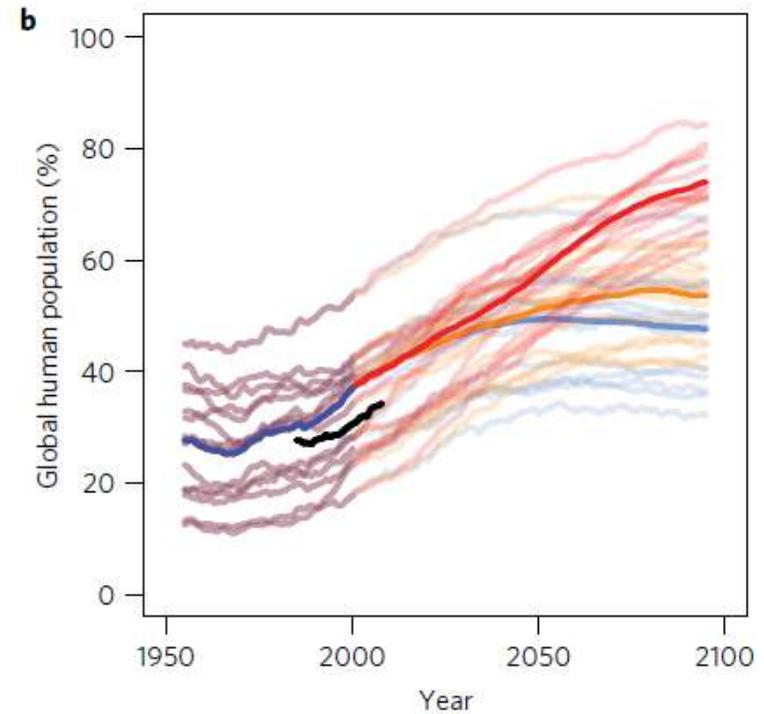
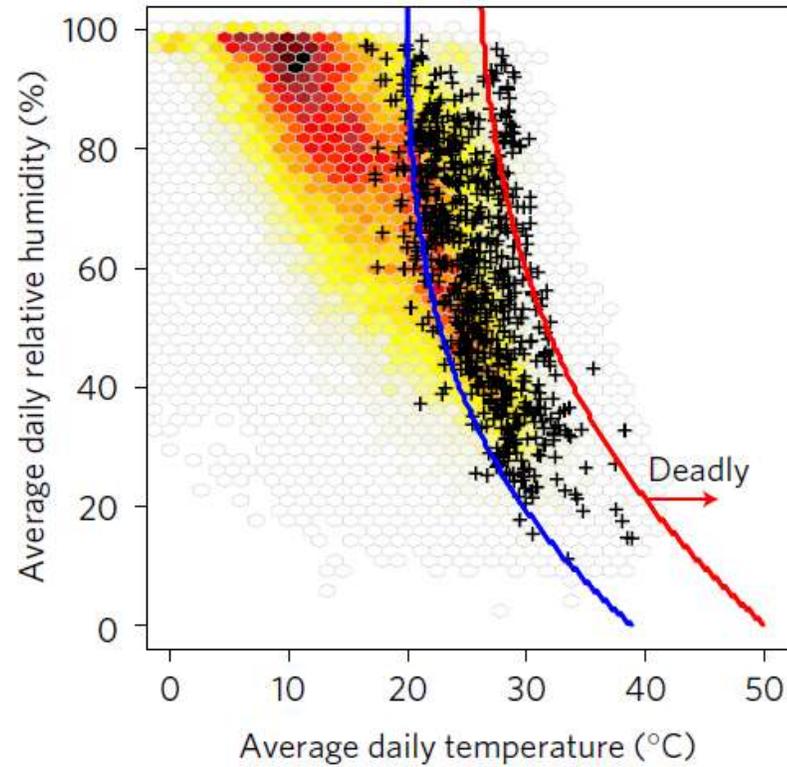
Réchauffement méditerranéen,  
pendant le jour le plus chaud  
de l'année (°C)



1:1 line

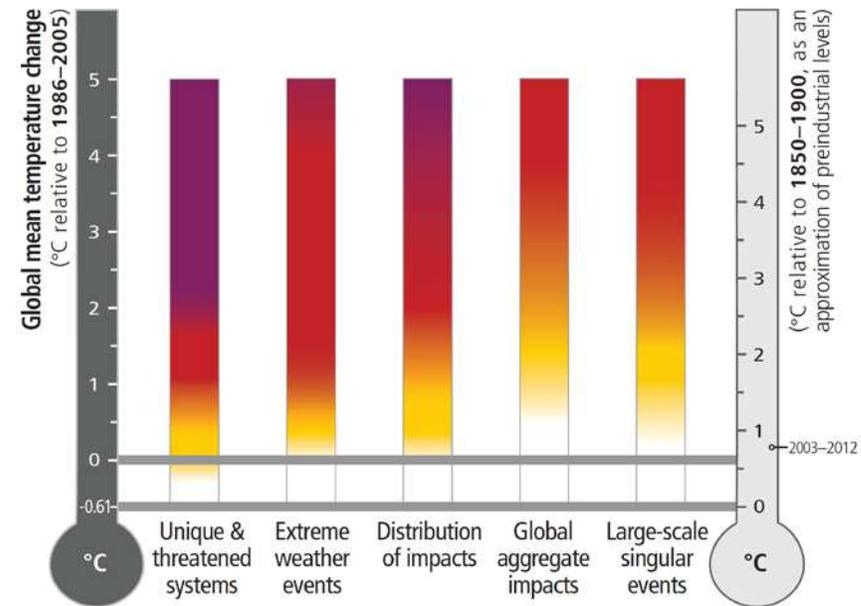
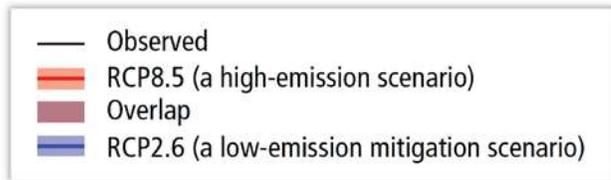
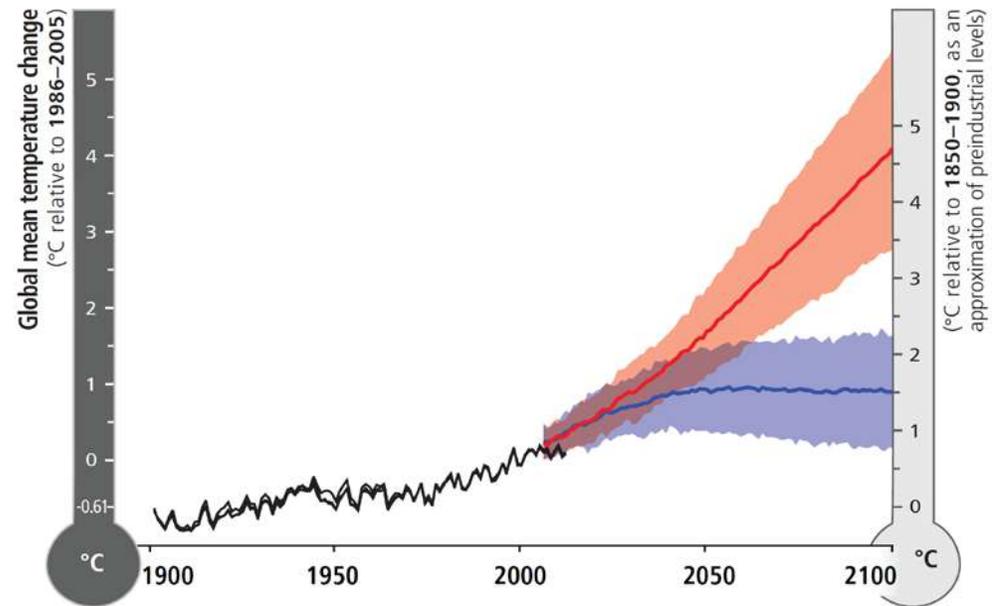
(Seneviratne et al., 2016 Nature)

# Risque mondial de chaleur mortelle



(Mora et al., 2017 NCC)

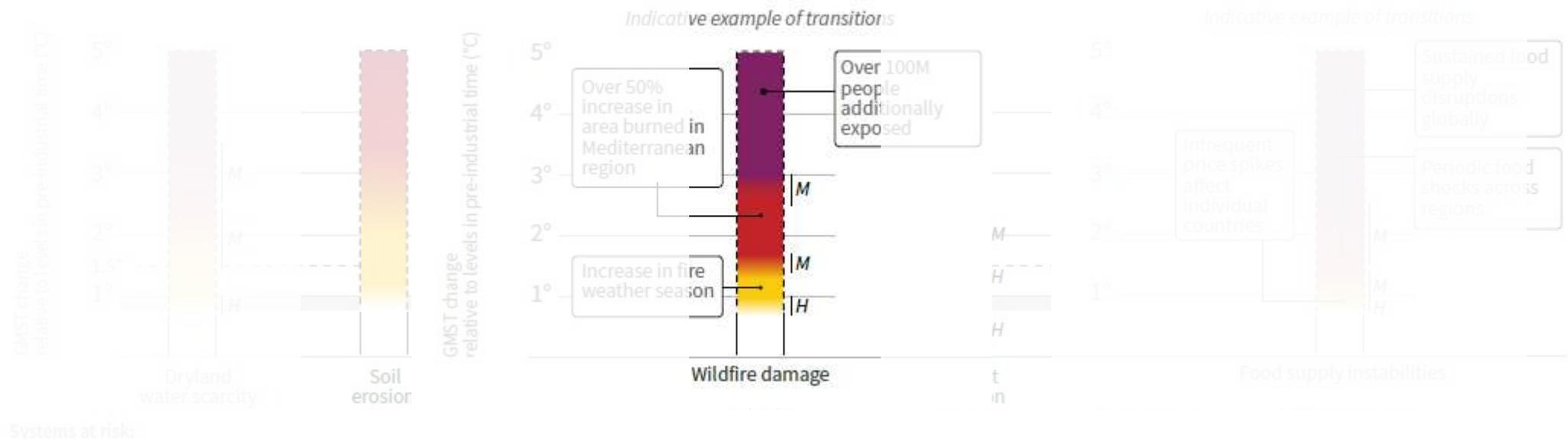
# Le role du GIEC



(IPCC, 2013; AR5)

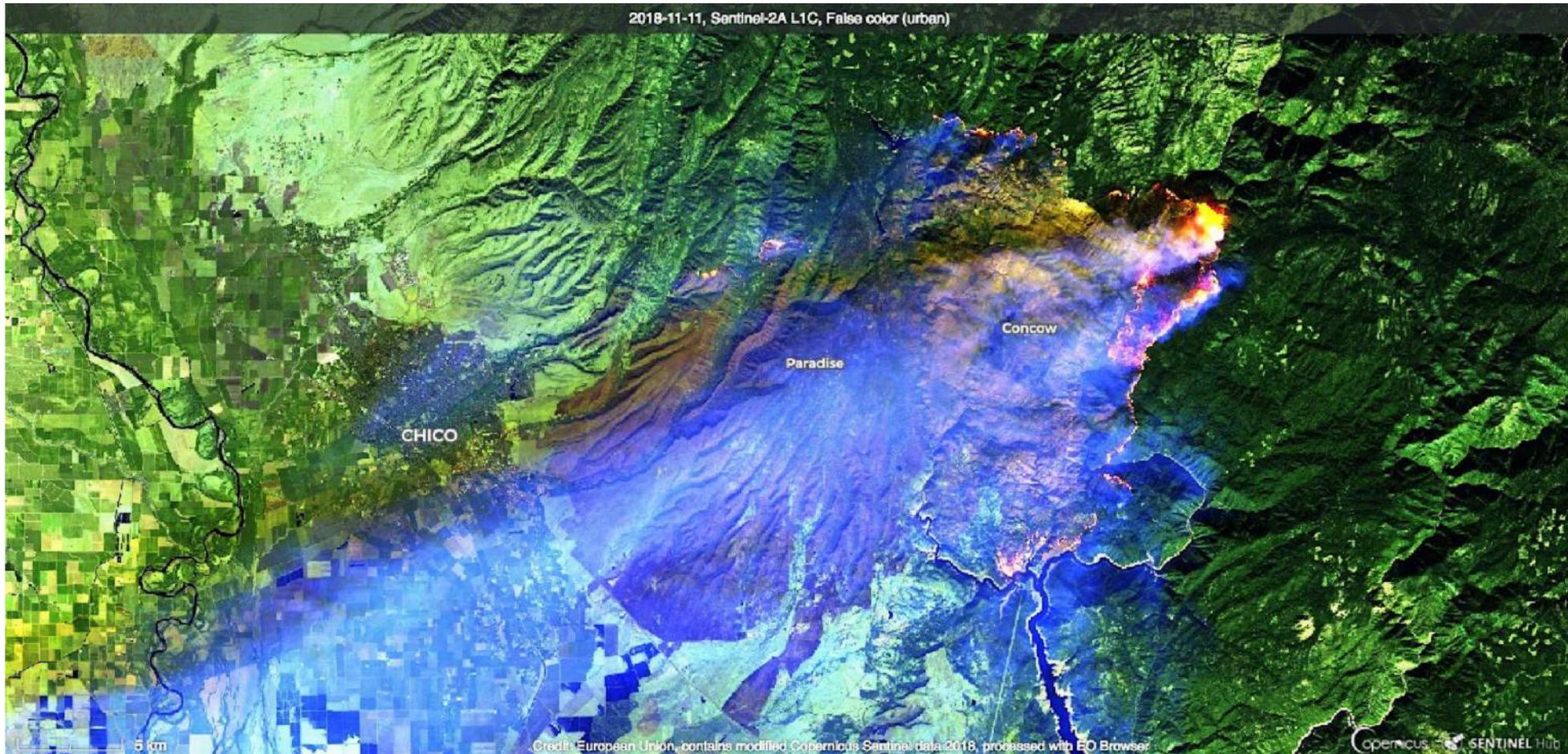
# Actualisation des 'burning embers' dans SRCCL

focus sur les risques liés à la désertification, dégradation des terres et sécurité alimentaire



Land degradation = 'a negative trend in land condition, caused by direct or indirect human induced processes, including anthropogenic climate change, expressed as long-term reduction and as loss of at least one of the following: biological productivity, ecological integrity, or value to humans'.

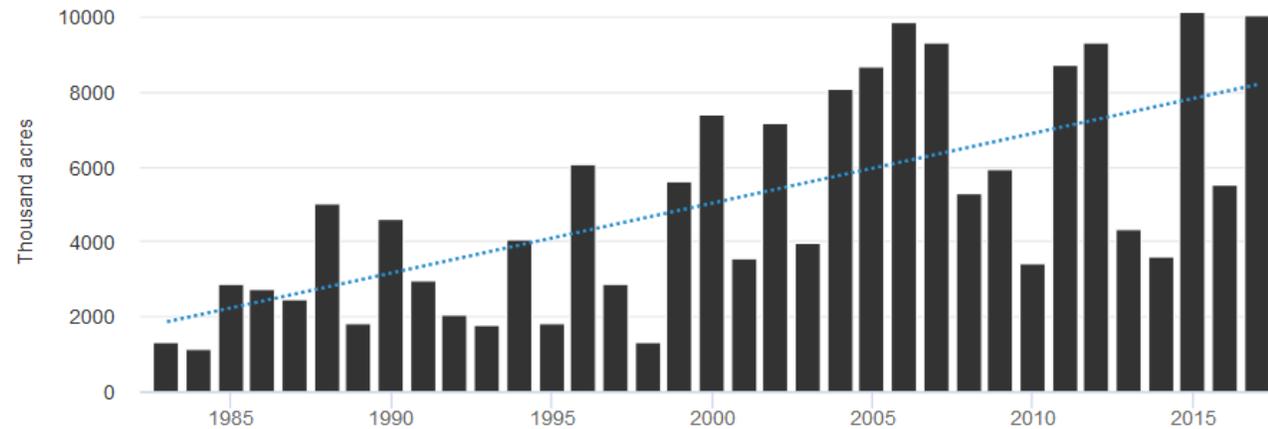
# Incendies de forêt en Californie (2018 & 2019)



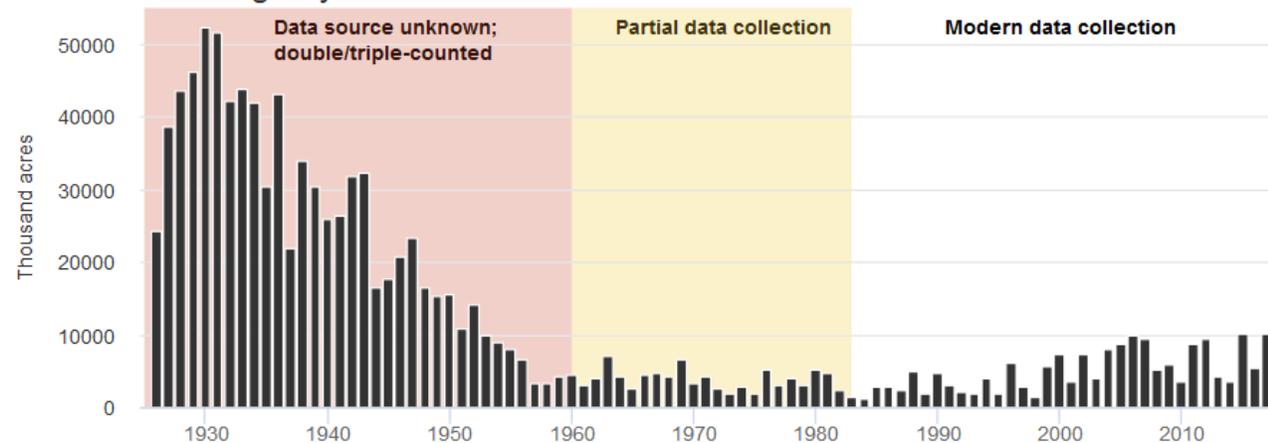
# Fiabilité des données

## exemple des incendies de forêt aux États-Unis

Wildland acres burned during the period with reliable data



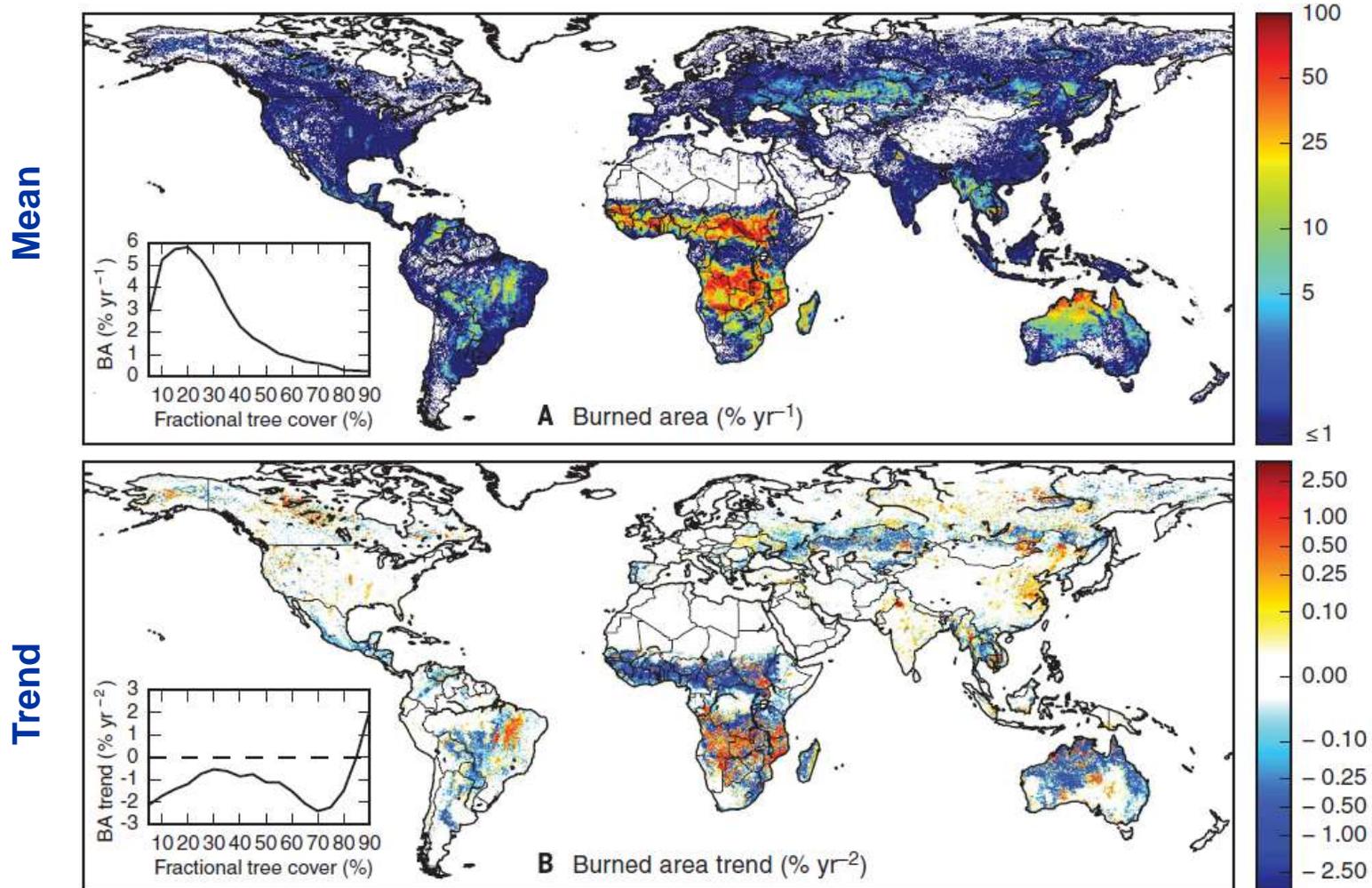
All National Interagency Fire Center wildland fire data



(<https://www.carbonbrief.org/factcheck-how-global-warming-has-increased-us-wildfires>)

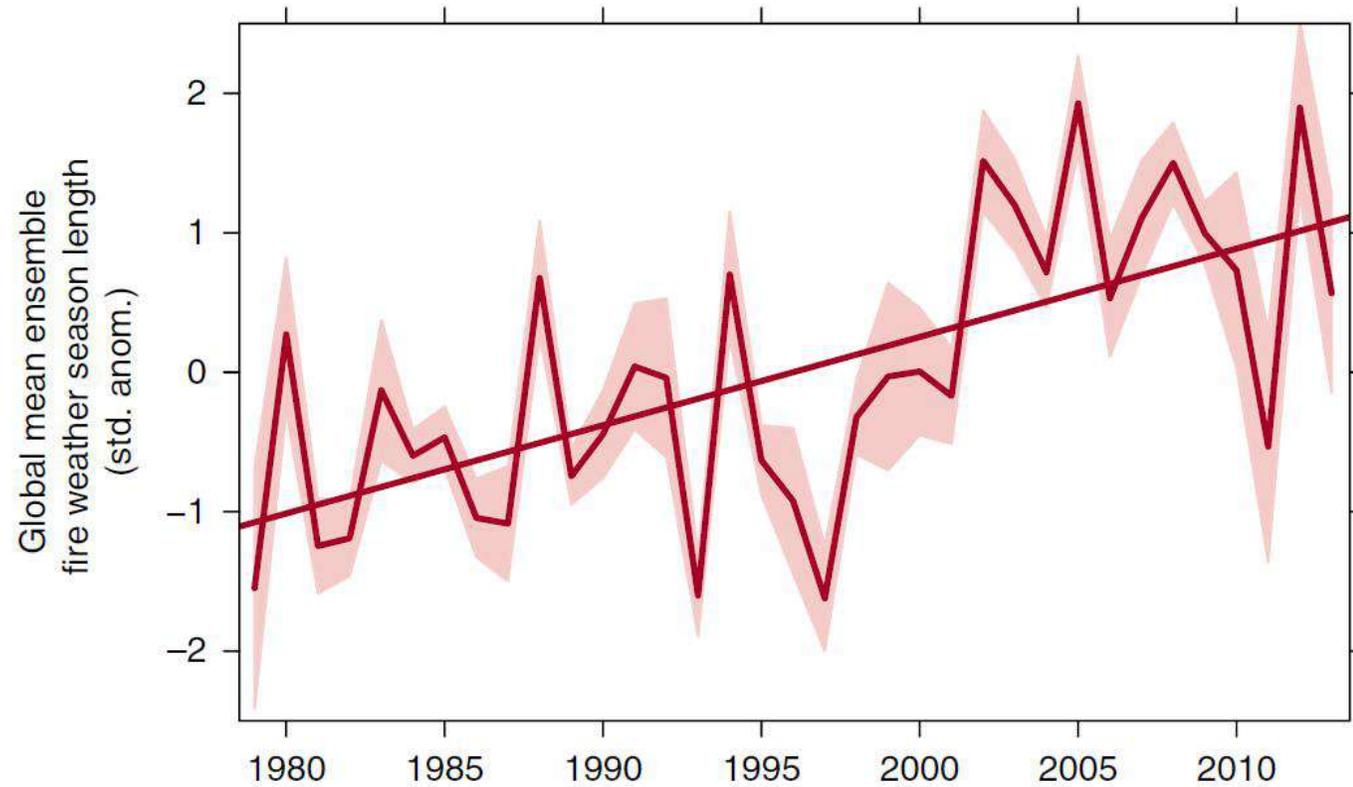
# Climat ou gestion humaine?

Signes d'un déclin récent causé par l'homme dans les zones brûlées à l'échelle globale



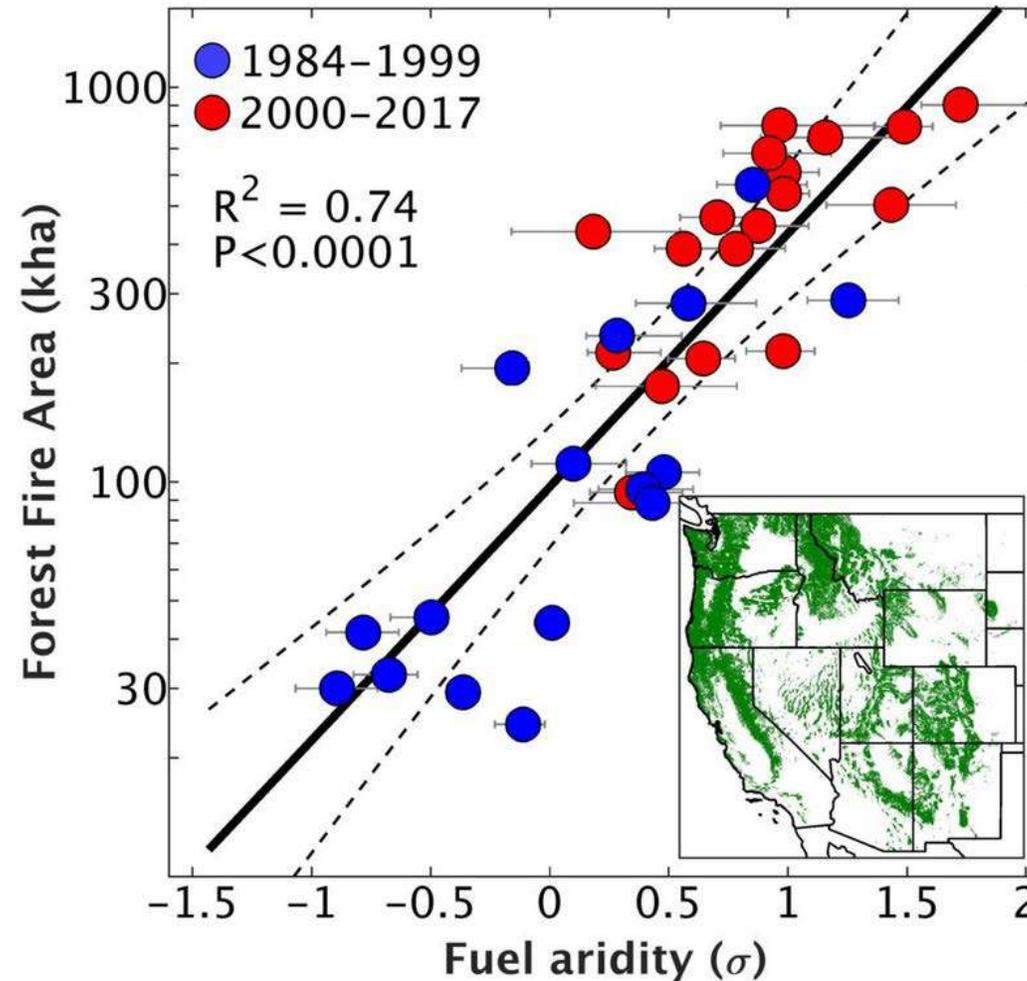
(Andela et al., 2017 Science)

# Augmentation de la durée de la saison des feux de forêt



(Jolly\_et al., 2017 NComm)

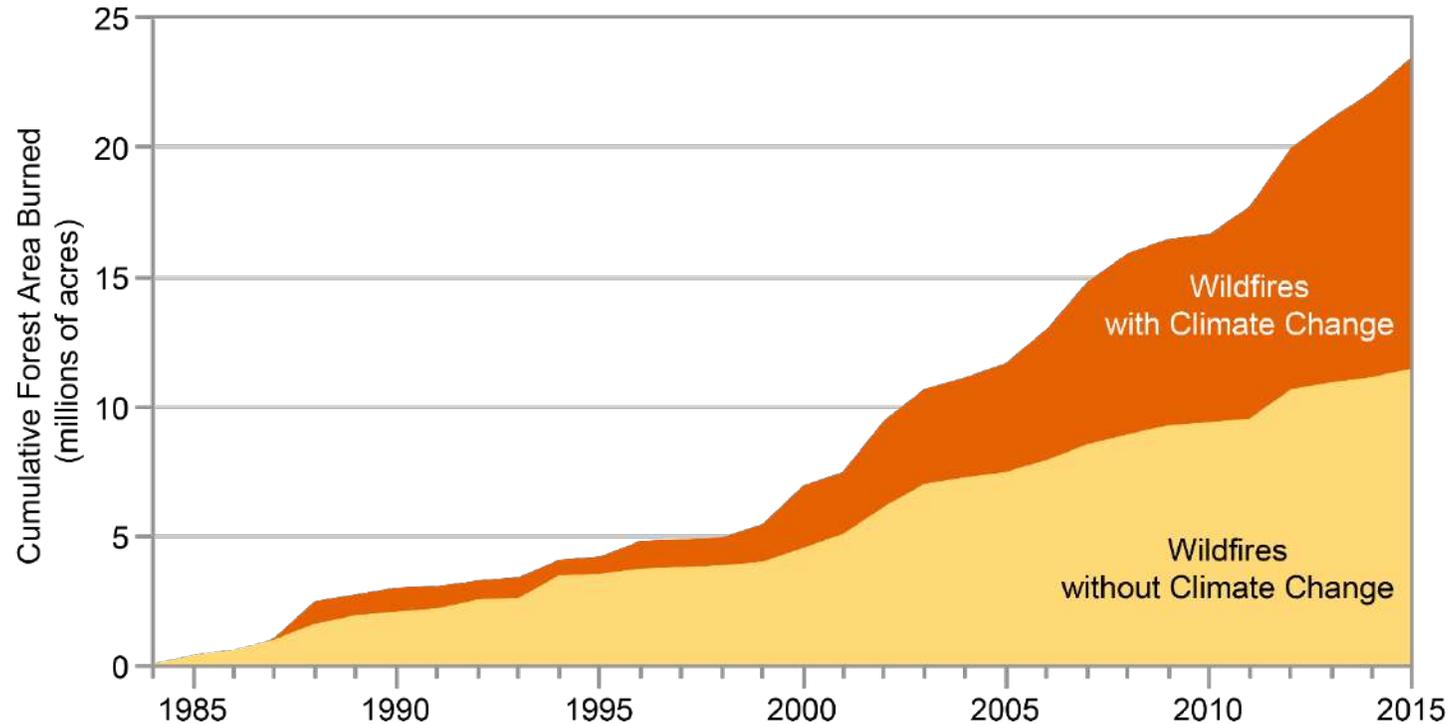
# Importance de l'aridité du combustible



(Adapted from Abatzoglou and Williams, 2016 PNAS)

# Le changement climatique a doublé la superficie brûlée en W-USA

## Attribution à base de modèles



(Adapted from Abatzoglou and Williams, 2016 PNAS)



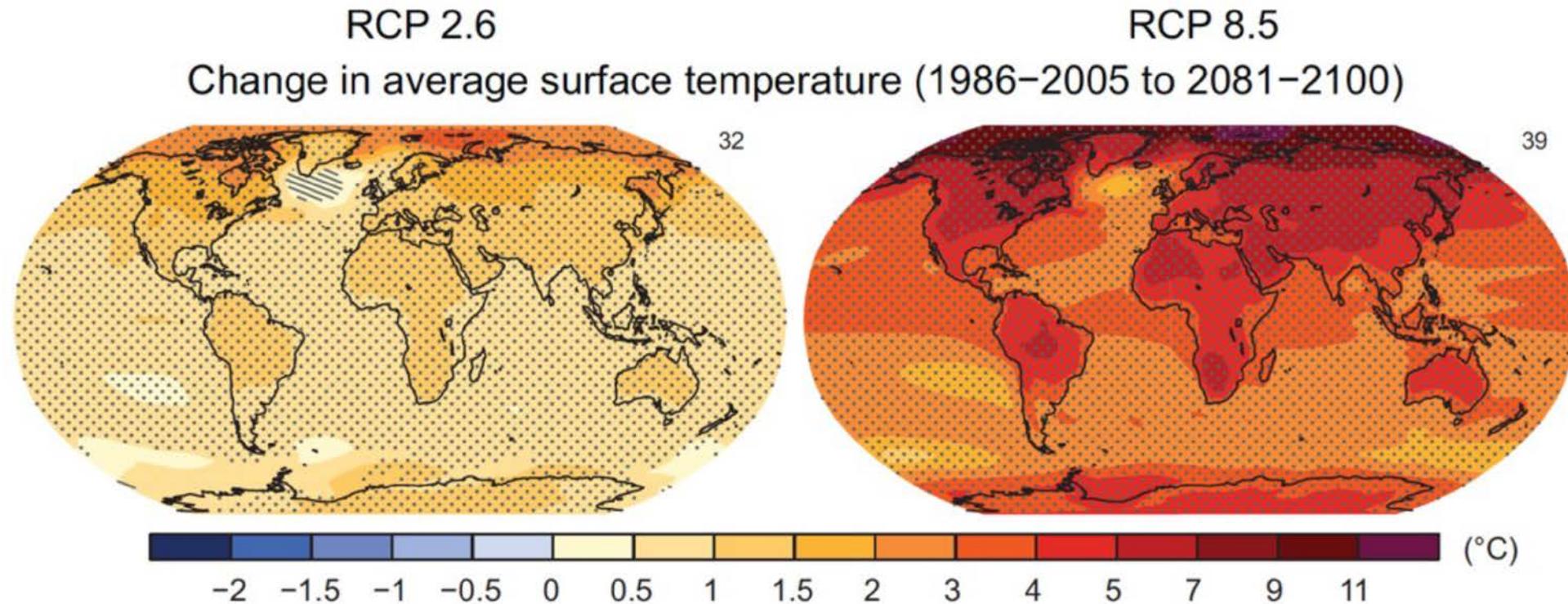
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# Nous avons un choix



(IPCC , 2013 AR5 SPM)

# Nations Unies

## Conférence sur les Changements Climatiques 2015

COP21/CMP11

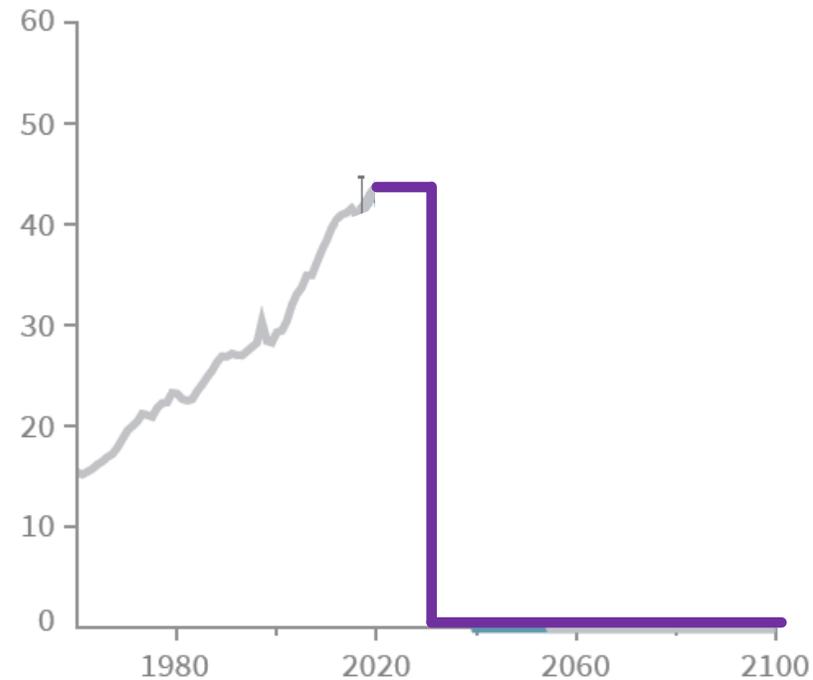
### Paris France



**“Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change;”**

**On a calculé la quantité de CO<sub>2</sub> que nous pouvons encore émettre.  
Dans le monde entier. Elle correspond à 11 fois les émissions de 2018.**

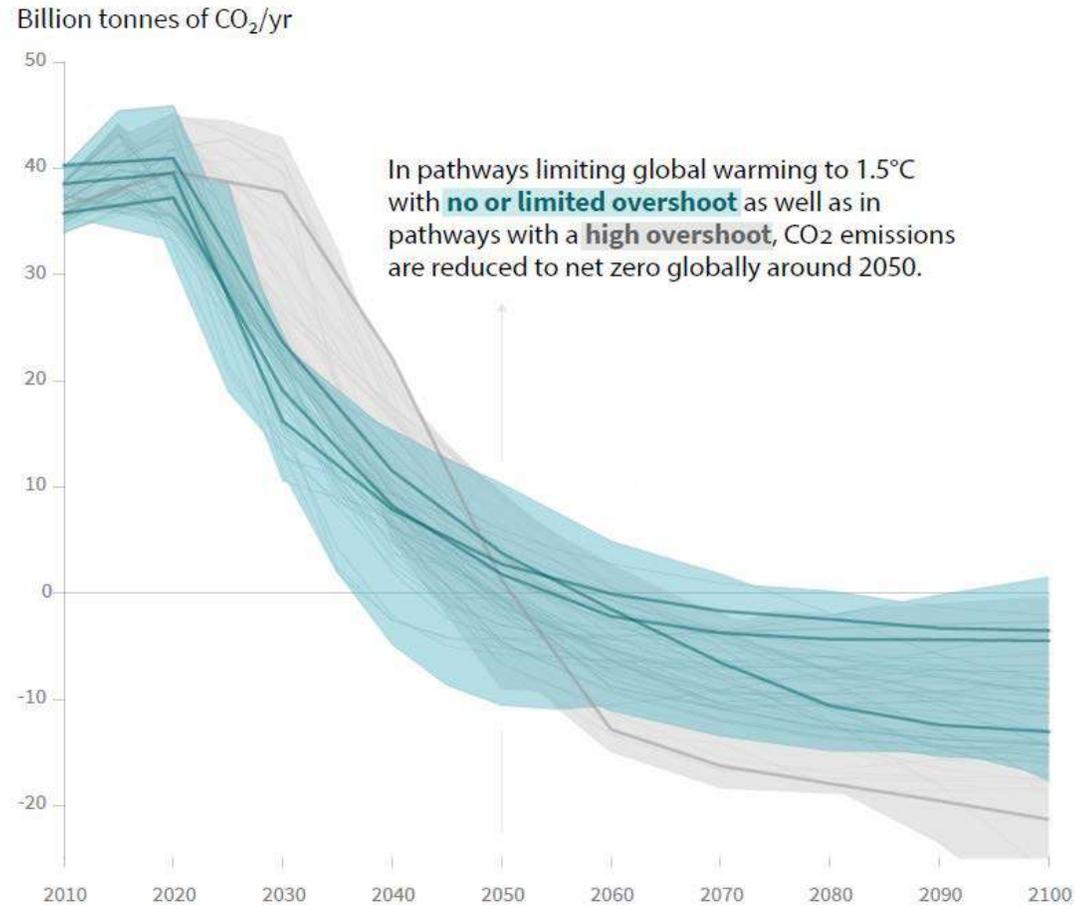
**b) Stylized net global CO<sub>2</sub> emission pathways**  
Billion tonnes CO<sub>2</sub> per year (GtCO<sub>2</sub>/yr)



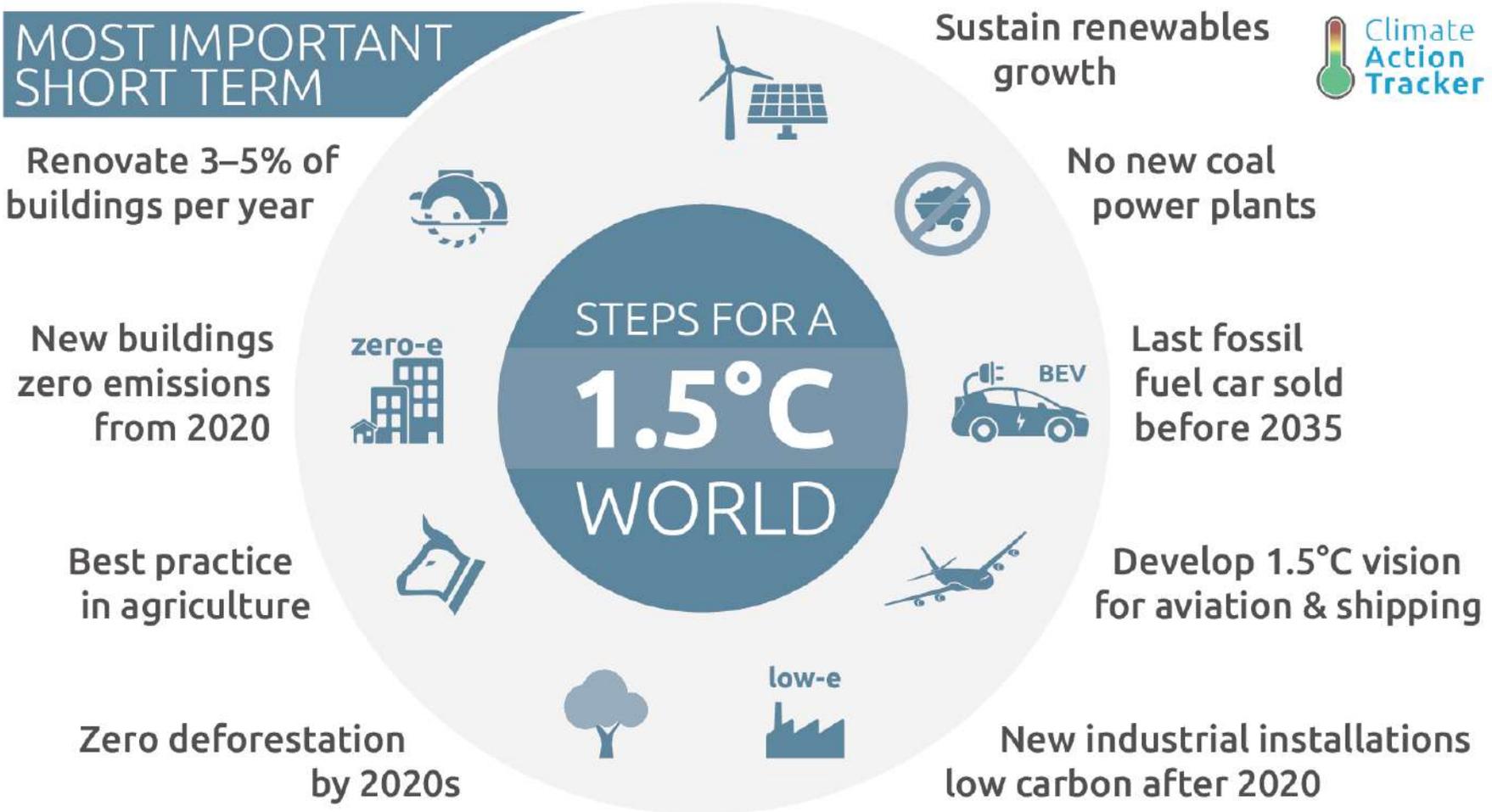
(IPCC, 2018 SR15 SPM)

# Des scénarios plus "réalistes"

## exigent des émissions nettes négatives après 2050



(IPCC, 2018 SR15 SPM)

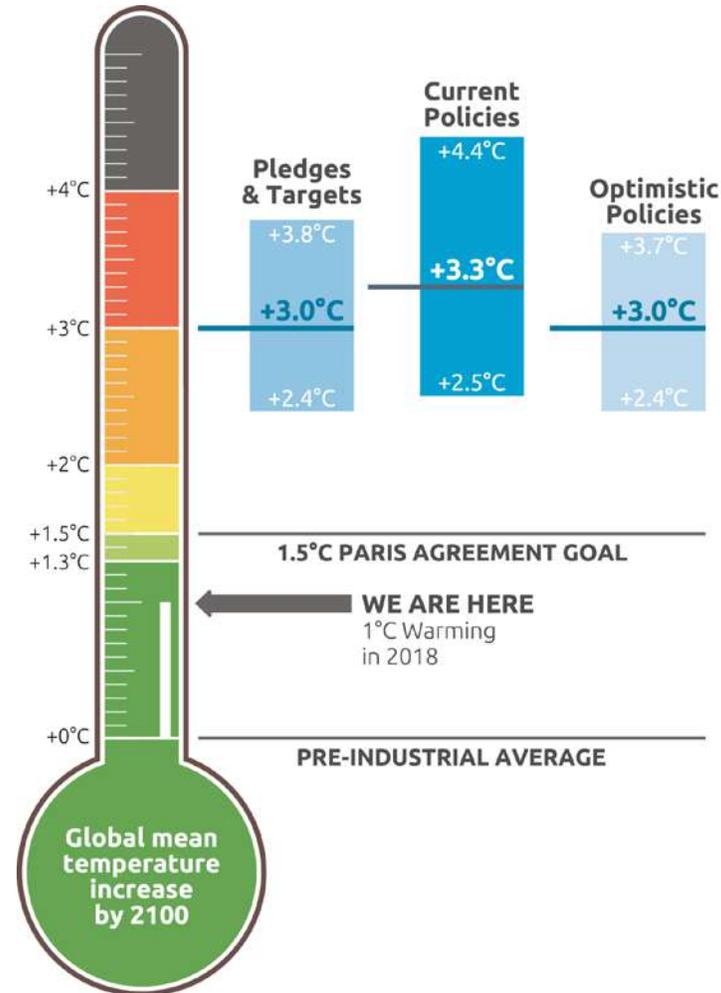


[www.climateactiontracker.org](http://www.climateactiontracker.org)

(Kuramochi et al., 2018 CP)

# Où en sommes-nous aujourd'hui?

le réchauffement climatique basé sur ce que les pays promettent et font réellement



CAT warming projections  
Global temperature increase by 2100

December 2018 Update

(<http://climateactiontracker.org/>)





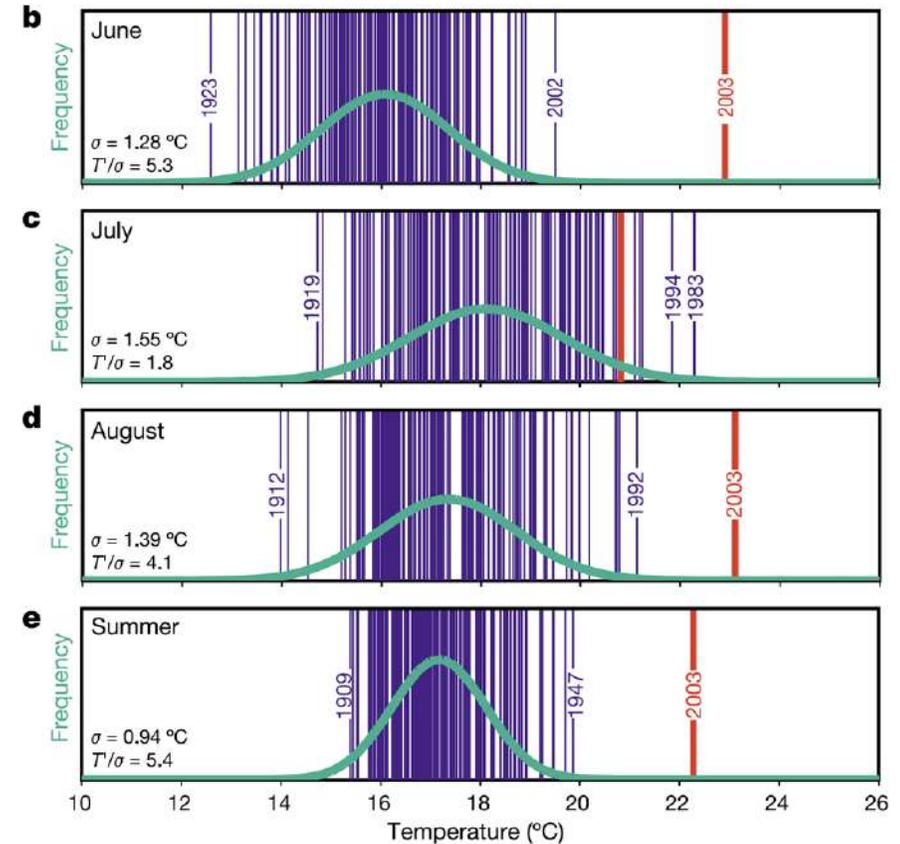
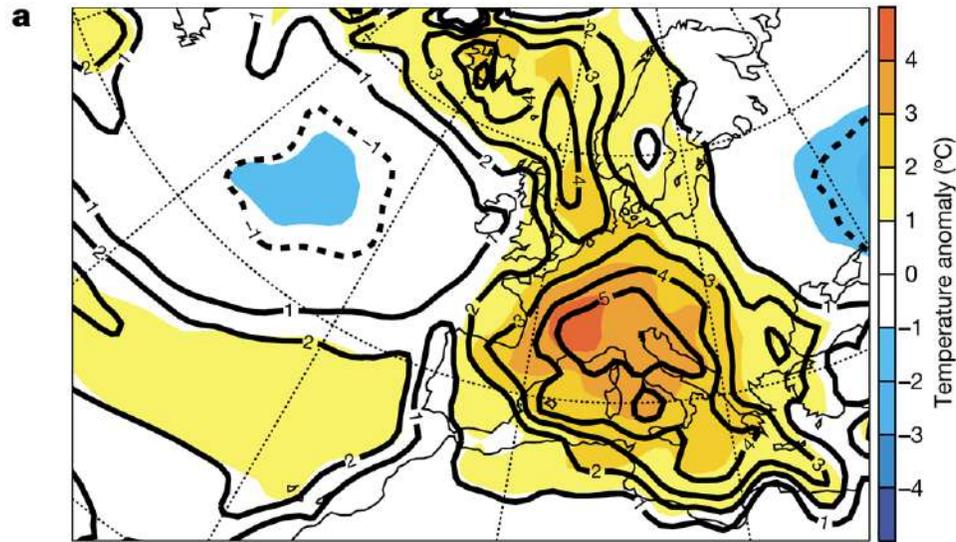
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# The 2003 Central European Summer heat wave



- Bold contours are for JJA temperature anomalies normalised by the 1961-1990 standard deviation

Blue lines are for individual years between 1864-2002 Red line is for 2003 (Data are for Switzerland)