

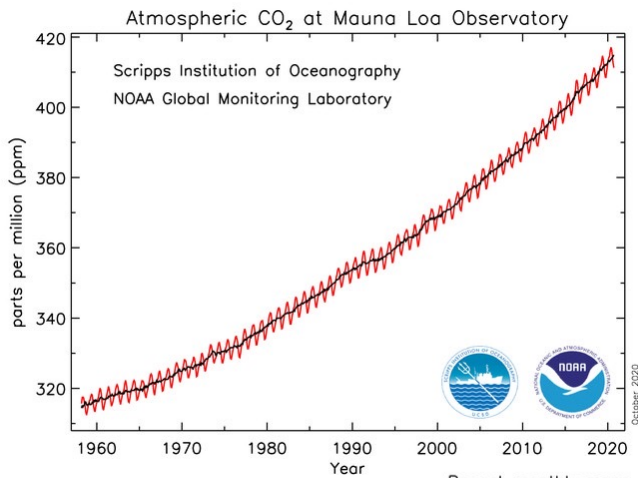
# Climate Change and Findings of the IPCC AR 6

Daniela Jacob

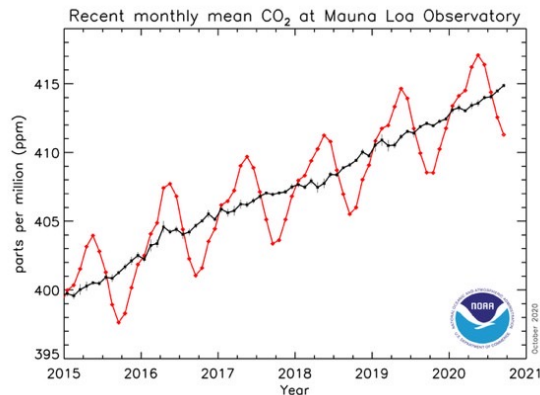
15.11.2021 | Meeting of the Standing Committee of the Baltic Sea Parliamentary Conference

# CO<sub>2</sub> and Methan concentrations in the atmosphere

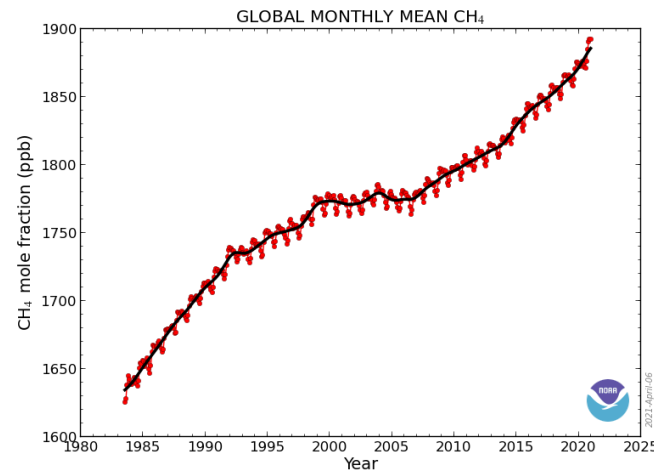
## CO<sub>2</sub> in the atmosphere (1958-2020)



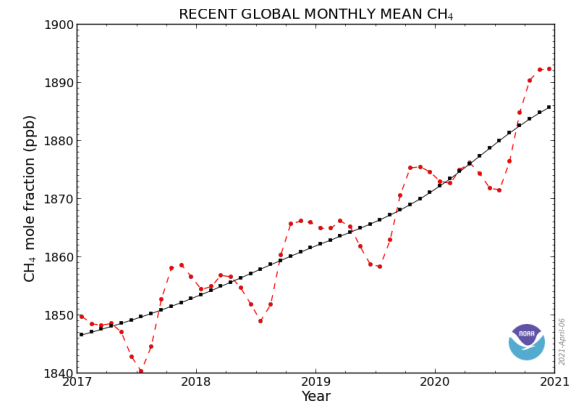
**March 2021:  
418 ppm**



## Methan in the atmosphere (1983-2021)



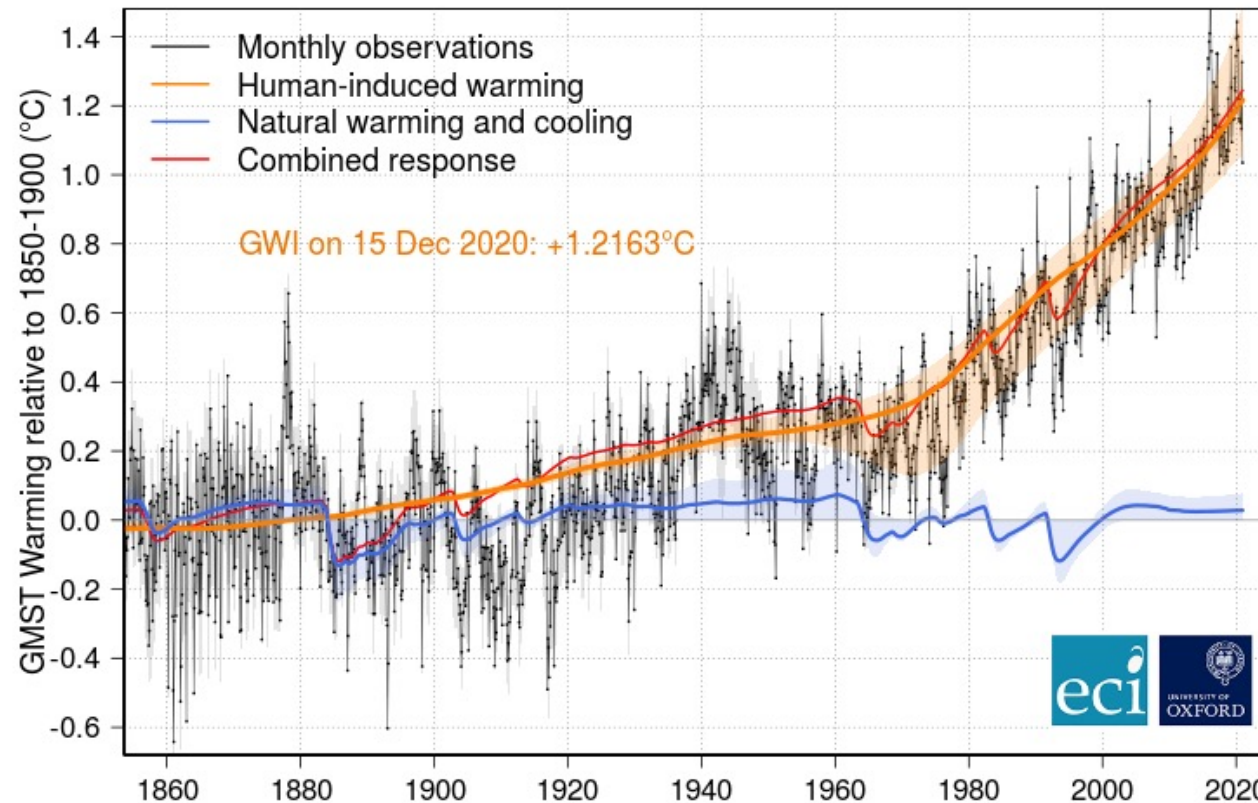
**highest conc.  
end of 2020**



Source: <https://www.esrl.noaa.gov/gmd/ccgg/trends/mlo.html>

## ■ Attributable human induced global warming until 2020 (vs 1850-1900)

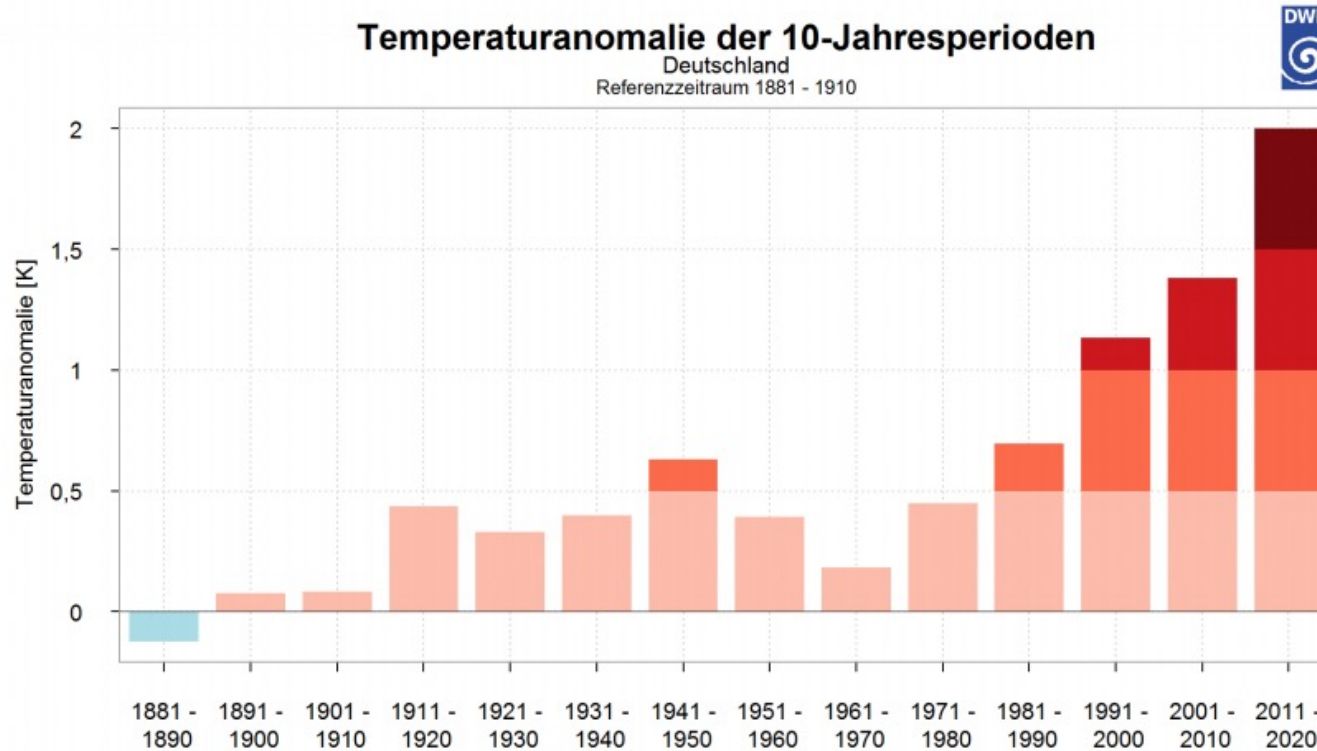
Global Warming Index (aggregate observations) - updated to Dec 2020



Source: <https://www.globalwarmingindex.org/>

globalwarmingindex.org

## Decadal average of mean temperature change (1881-2020) & the 10 warmest years in Germany (annual mean temperature)

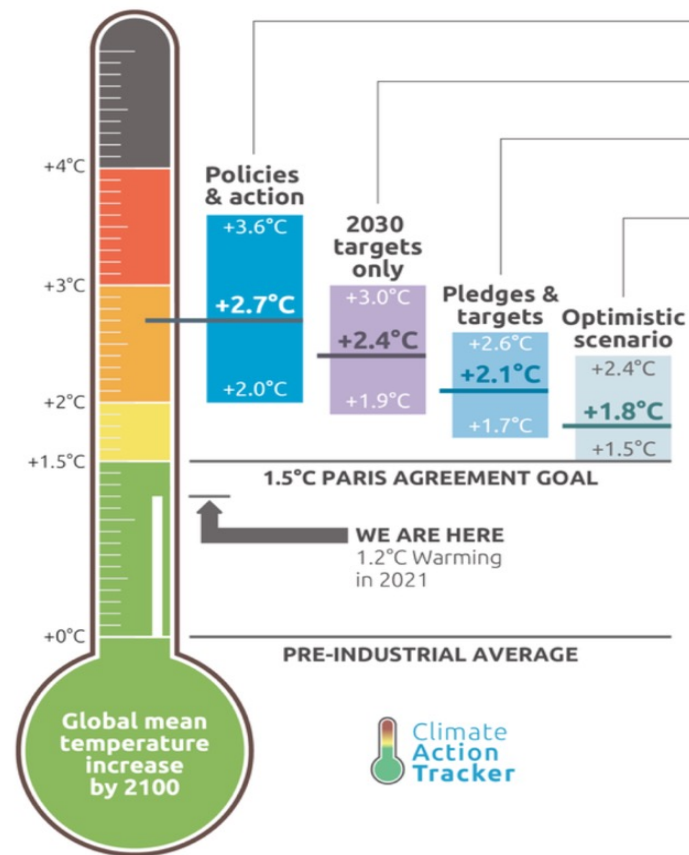
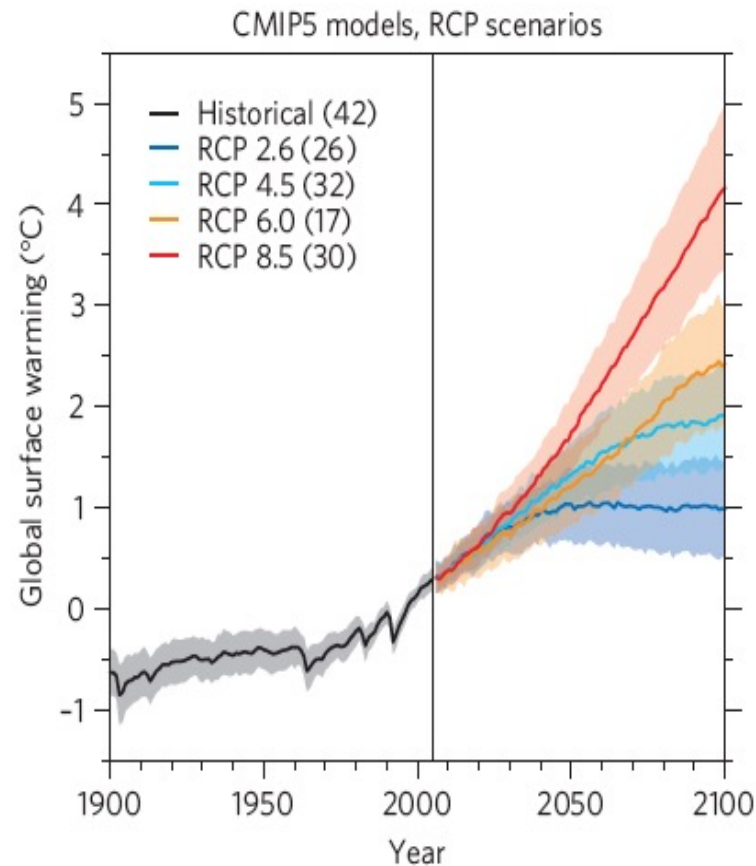


JAHR	ABWEICHUNG (in Bezug auf 1881-1910)
2018	+2,7 °C
2019	+2,5 °C
2014	+2,5 °C
2015	+2,1 °C
2007	+2,1 °C
2000	+2,1 °C
1994	+1,9 °C
2017	+1,8 °C
2011	+1,8 °C
2002	+1,8 °C

Quelle: DWD

Source: [https://www.dwd.de/DE/leistungen/besondereereignisse/temperatur/20210106\\_rueckblick\\_jahr\\_2020.pdf?\\_\\_blob=publicationFile&v=7](https://www.dwd.de/DE/leistungen/besondereereignisse/temperatur/20210106_rueckblick_jahr_2020.pdf?__blob=publicationFile&v=7)

## Projected global mean temperature change



### Policies & action

Real world action based on current policies

### 2030 targets only

Full implementation of 2030 NDC targets\*

### Pledges & targets

Full implementation of submitted and binding long-term targets and 2030 NDC targets\*

### Optimistic scenario

Best case scenario and assumes full implementation of all **announced** targets including net zero targets, LTSs and NDCs\*

\* If 2030 NDC targets are weaker than projected emissions levels under policies & action, we use levels from policy & action

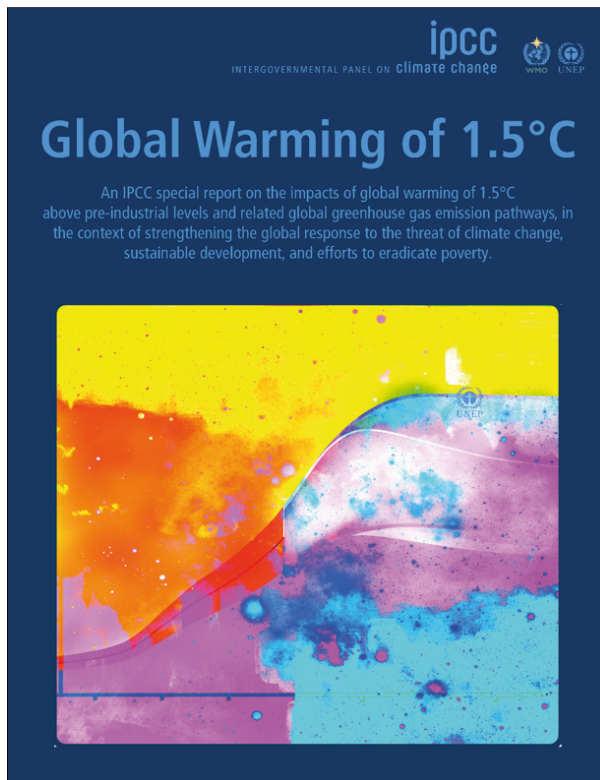
CAT warming projections  
**Global temperature increase by 2100**

November 2021 Update

Source: Knutti and Sedlacek 2012, Nature Climate Change

Source: <https://climateactiontracker.org>

## ■ IPCC special report SR1.5



### Key statements of the Summary for Policymakers

(Part B “Projected Climate Change, Potential Impacts and Associated Risks”)

### Impacts of global warming – 1.5°C compared to 2°C

- Less extreme weather where people live, including extreme heat and rainfall
- By 2100, global mean sea level rise will be around 10 cm lower but may continue to rise for centuries
- 10 million fewer people exposed to risk of rising seas.
- Lower impact on biodiversity and species.
- Smaller reductions in yields of maize, rice, wheat
- Global population exposed to increased water shortages is up to 50% less
- Lower risk to fisheries and the livelihoods that depend on them
- Up to several hundred million fewer people exposed to climate-related risk and susceptible to poverty by 2050



## ■ IPCC report AR6 – key messages of the experts (WG I)

Sixth Assessment Report  
**WORKING GROUP I**  
The Physical Science Basis

ipcc  
INTERGOVERNMENTAL PANEL ON climate change

WHO UNEP

Emissions of greenhouse gases from human activities are responsible for approximately 1.1°C of warming since 1850–1900.

#IPCC  
#ClimateReport

Photo by Thomas Mohr on Unsplash

Sixth Assessment Report  
**WORKING GROUP I**  
The Physical Science Basis

ipcc  
INTERGOVERNMENTAL PANEL ON climate change

WHO UNEP

Averaged over the next 20 years, global temperature is expected to reach or exceed 1.5°C of warming.

#IPCC  
#ClimateReport

Sixth Assessment Report  
**WORKING GROUP I**  
The Physical Science Basis

ipcc  
INTERGOVERNMENTAL PANEL ON climate change

WHO UNEP

The evidence is clear that carbon dioxide (CO<sub>2</sub>) is the main driver of climate change, even as other greenhouse gases and air pollutants also affect the climate.

#IPCC  
#ClimateReport

Sixth Assessment Report  
**WORKING GROUP I**  
The Physical Science Basis

ipcc  
INTERGOVERNMENTAL PANEL ON climate change

WHO UNEP

Human actions still have the potential to determine the future course of climate.

#IPCC  
#ClimateReport

Source: [https://twitter.com/IPCC\\_CH](https://twitter.com/IPCC_CH)

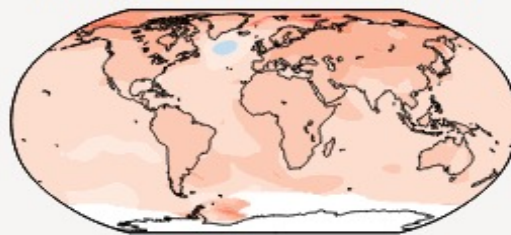
## ■ IPCC report AR6 (WG I) – findings (Summary for Policymakers)

With every increment of global warming, changes get larger in regional mean temperature and precipitation

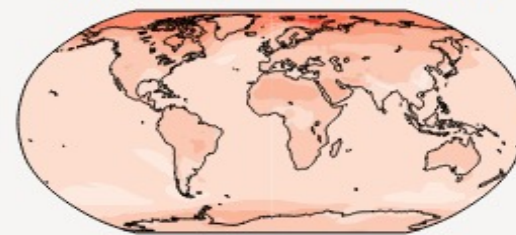
### a) Annual mean temperature change (°C) at 1 °C global warming

Warming at 1 °C affects all continents and is generally larger over land than over the oceans in both observations and models. Across most regions, observed and simulated patterns are consistent.

Observed change per 1 °C global warming



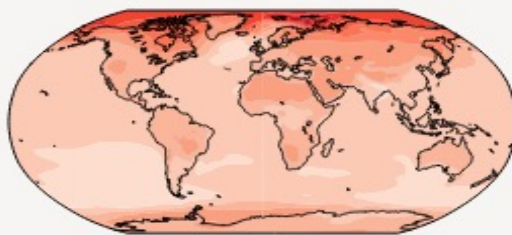
Simulated change at 1 °C global warming



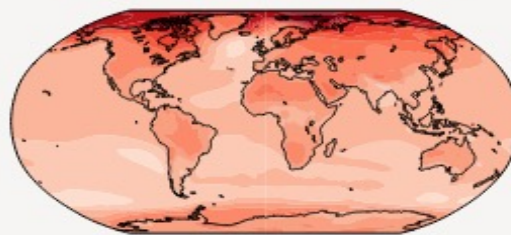
### b) Annual mean temperature change (°C) relative to 1850-1900

Across warming levels, land areas warm more than oceans, and the Arctic and Antarctica warm more than the tropics.

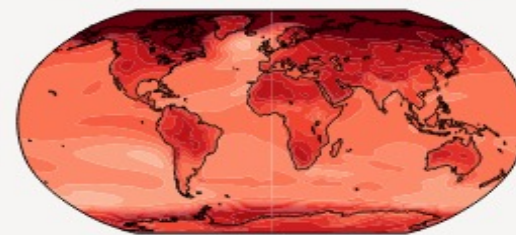
Simulated change at 1.5 °C global warming



Simulated change at 2 °C global warming



Simulated change at 4 °C global warming



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GERICS  
Climate Service Center  
Germany

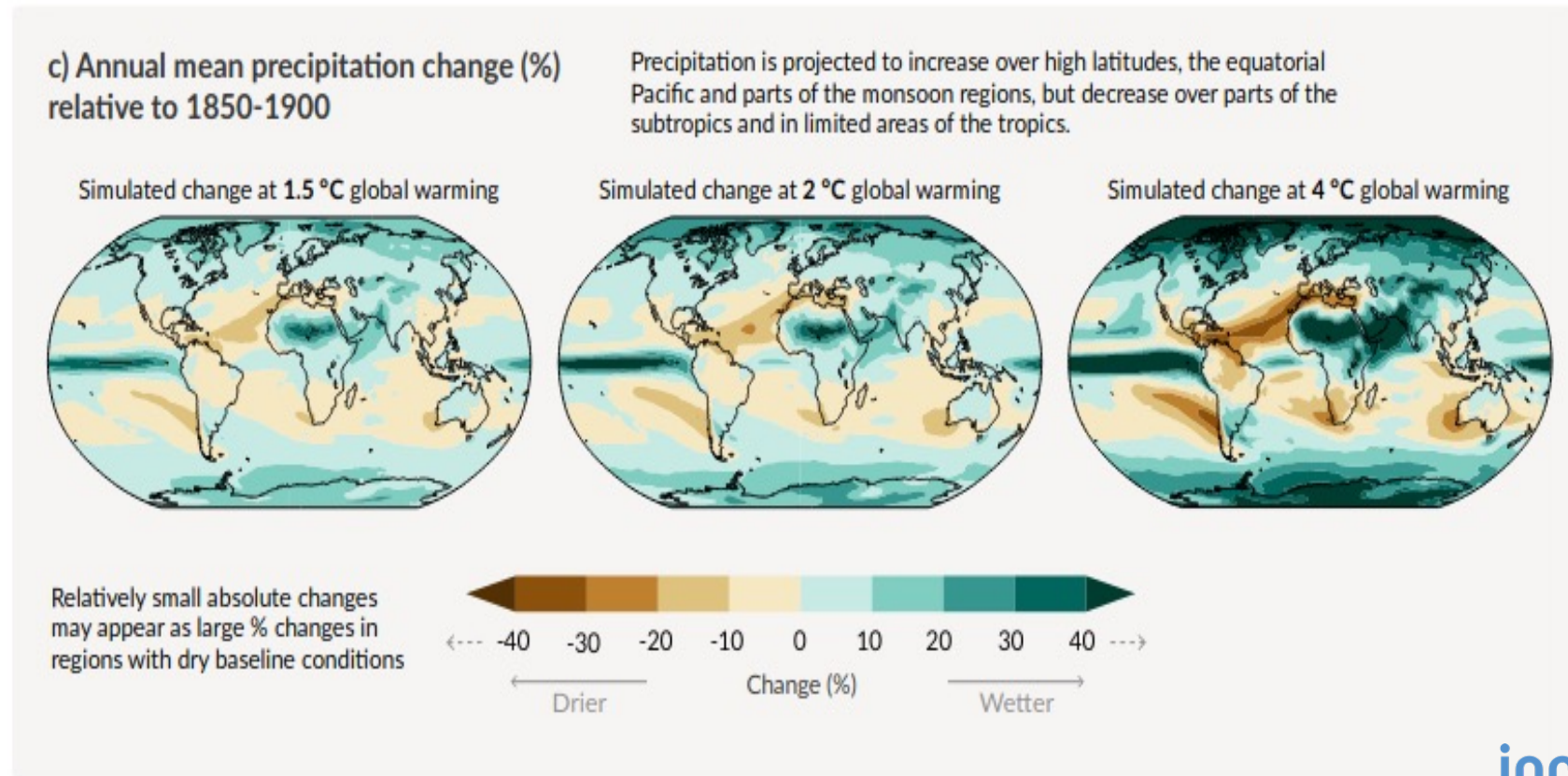
Source: [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_SPM\\_final.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf)

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## ■ IPCC report AR6 (WG I) – findings (Summary for Policymakers)

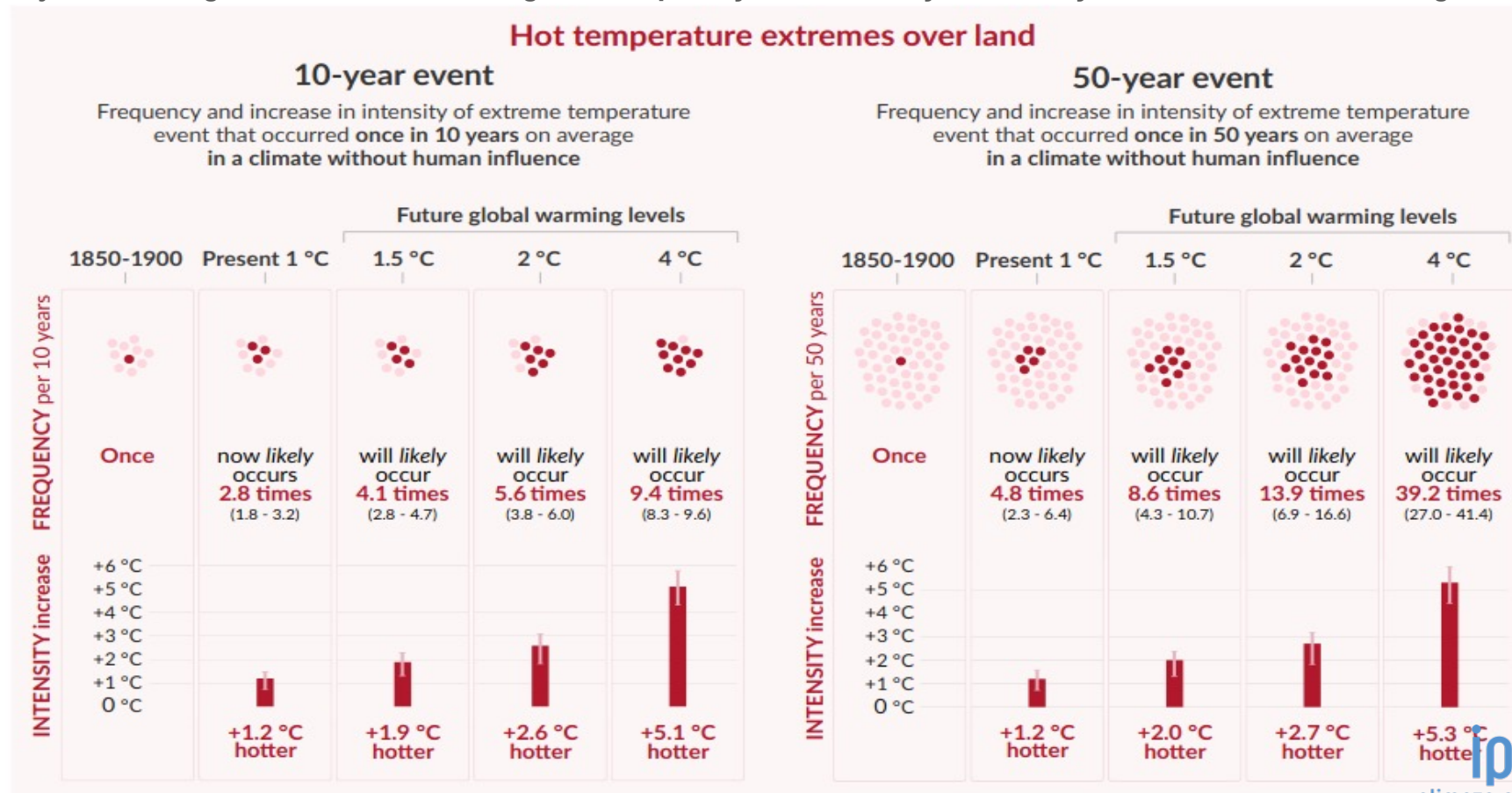
With every increment of global warming, changes get larger in regional mean temperature and precipitation



Source: [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_SPM\\_final.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf)

# IPCC report AR6 (WG I) – findings (Summary for Policymakers)

Projected changes in extremes are larger in frequency and intensity with every additional increment of global warming



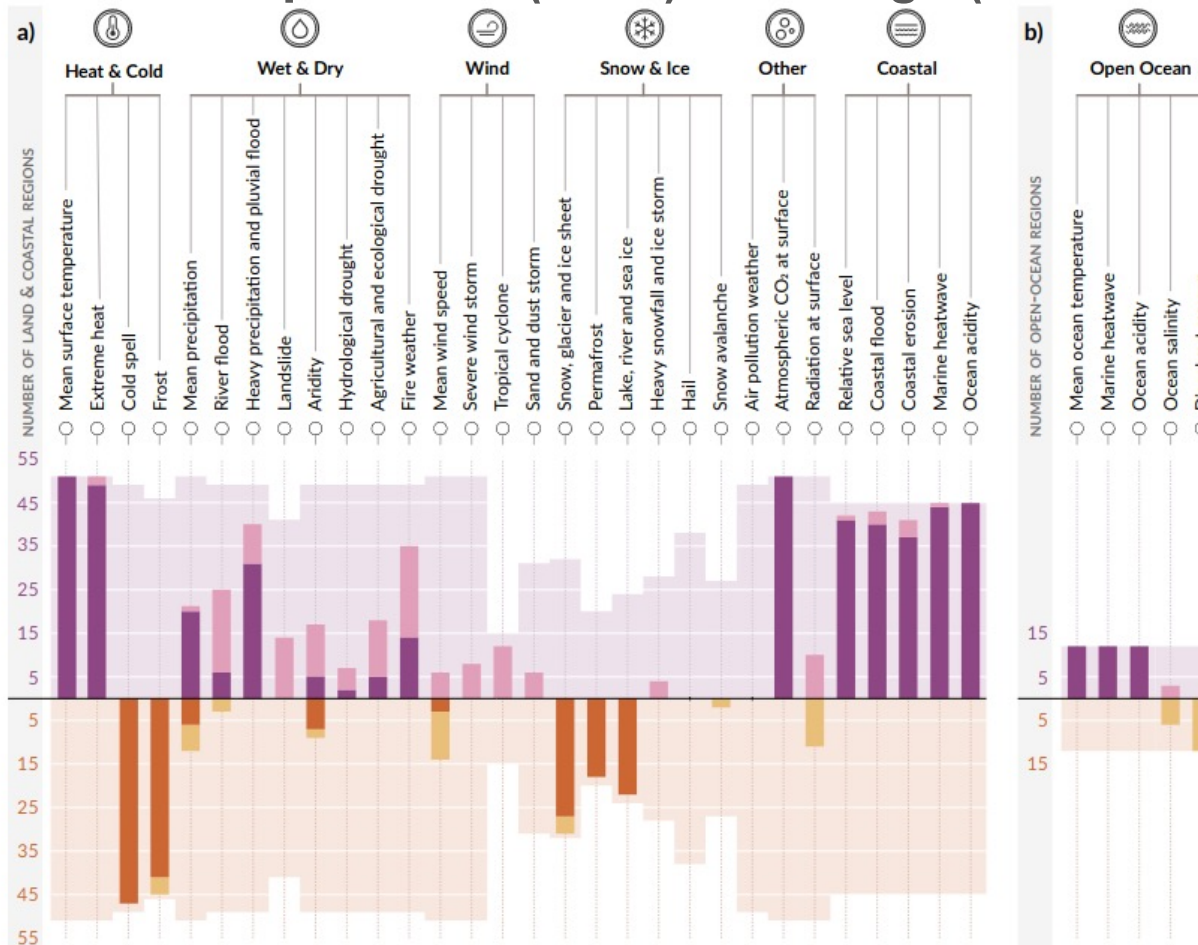
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Source: [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_SPM\\_final.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf)

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# IPCC report AR6 (WG I) – findings (Summary for Policymakers)



Number of land & coastal regions (a) and open-ocean regions (b) where each climatic impact-driver (CID) is projected to **increase** or **decrease** with high confidence (dark shade) or medium confidence (light shade)

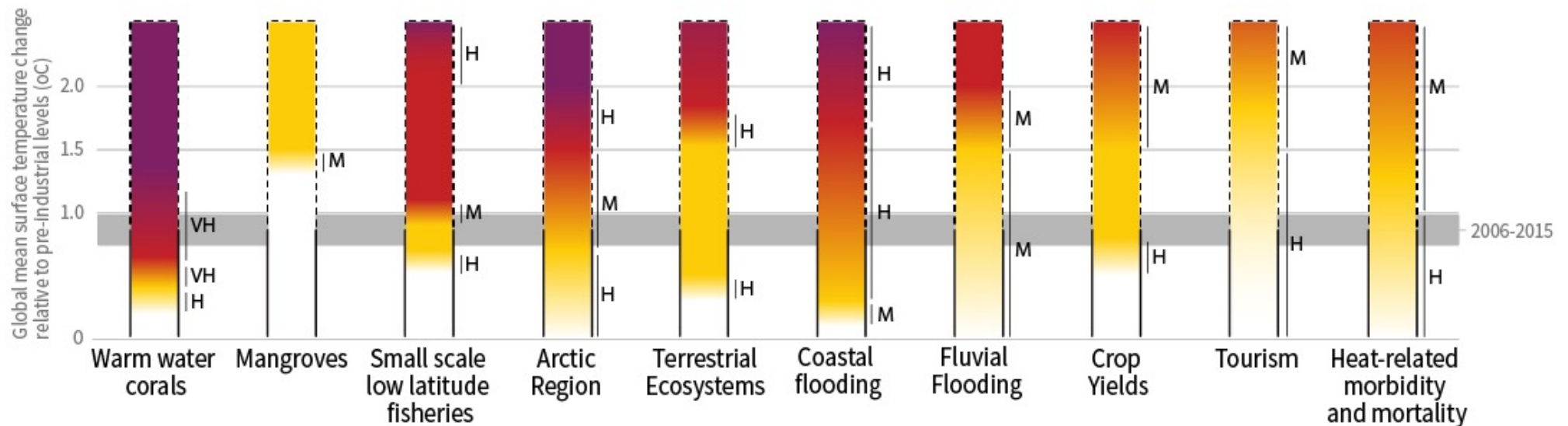
Source: [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_SPM\\_final.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf)



## Impacts of climate change - IPCC special report SR1.5

**SPM2** | How the level of global warming affects impacts and/or risks associated with the Reasons for Concern (RFCs) and selected natural, managed and human systems

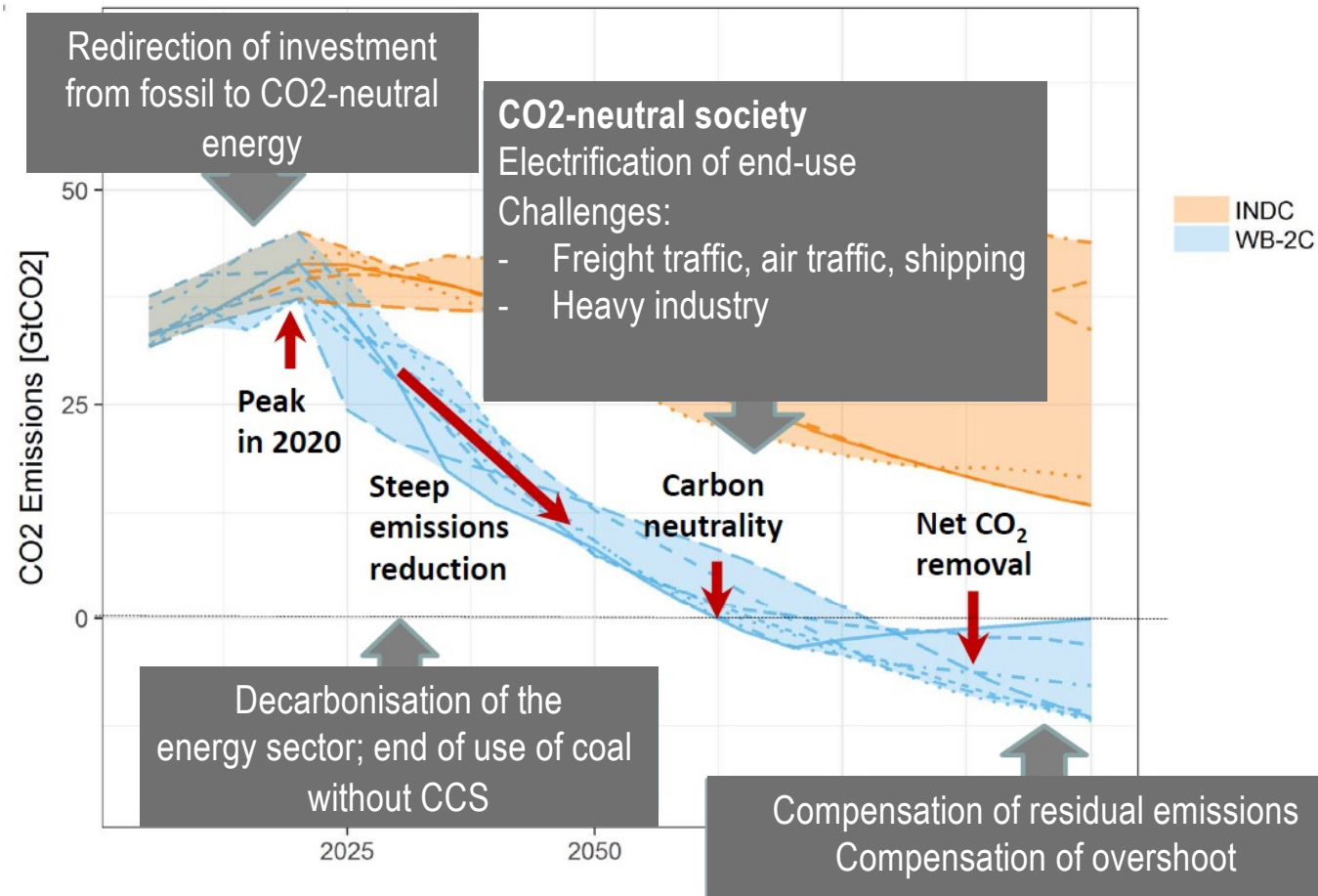
### Impacts and risks for selected natural, managed and human systems



Confidence level : M, medium; H, high; VH; very high



## Basic structure of climate pathways



Source: Luderer et al. (2018): *Residual fossil CO emissions in 1.5-2 ° C pathways*. Nature Climate Change / E. Kriegler (PIK, 2018) (modified)

## ■ It is time to combate climate change and to adapt...

- For our environment
- For us humans
- For our economy
- For our infrastructure
- For our way of life
- For our habitats
  - coasts are flooded and eroded
  - Small island become uninhabitable
  - Coastal cities/villages have to be relocated
  - .... and many more....
- **For the well-being of the next generations**

**It's in our hands!**

Thank You

