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# Výběr ze dvou prezentací prvního dílu 6. hodnotící zprávy IPCC

srpen 2021

**Jan Hollan**

EVROPSKÁ UNIE
EVROPSKÝ FOND PRO REGIONÁLNÍ ROZVOJ
ŠANCE PRO VÁŠ ROZVOJ

**SIXTH ASSESSMENT REPORT**
Working Group I – The Physical Science Basis

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INTERGOVERNMENTAL PANEL ON climate change

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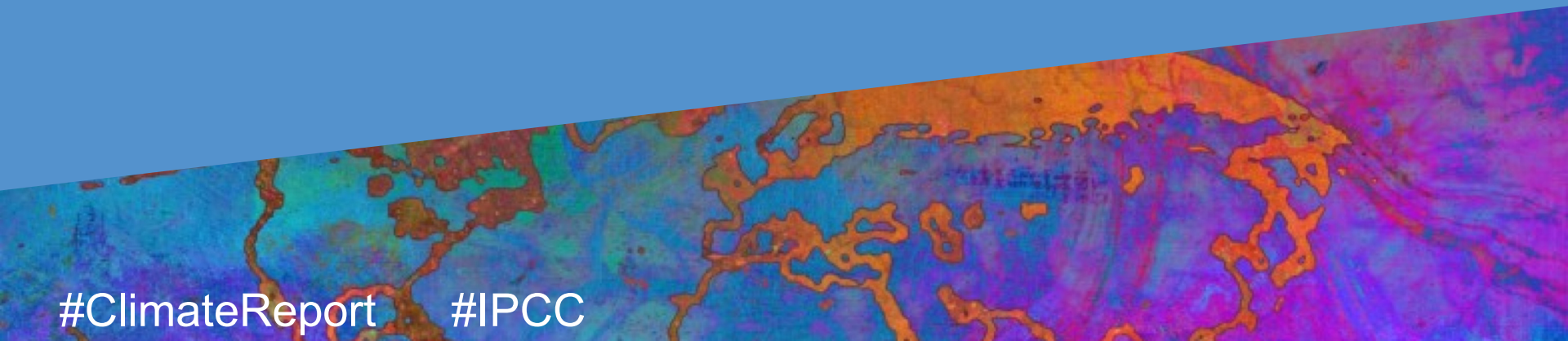
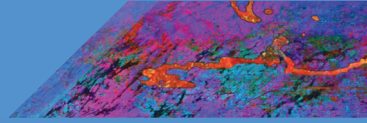
**[Presentation Date]**

# [Presentation Name]

[Presenter Name, Title]



#ClimateReport #IPCC



# BY THE NUMBERS

## Author Team

**234** authors from **65** countries

**28%** women, **72%** men

**30%** new to the **IPCC**

## Review Process

**14,000** scientific publications assessed

**78,000+** review comments

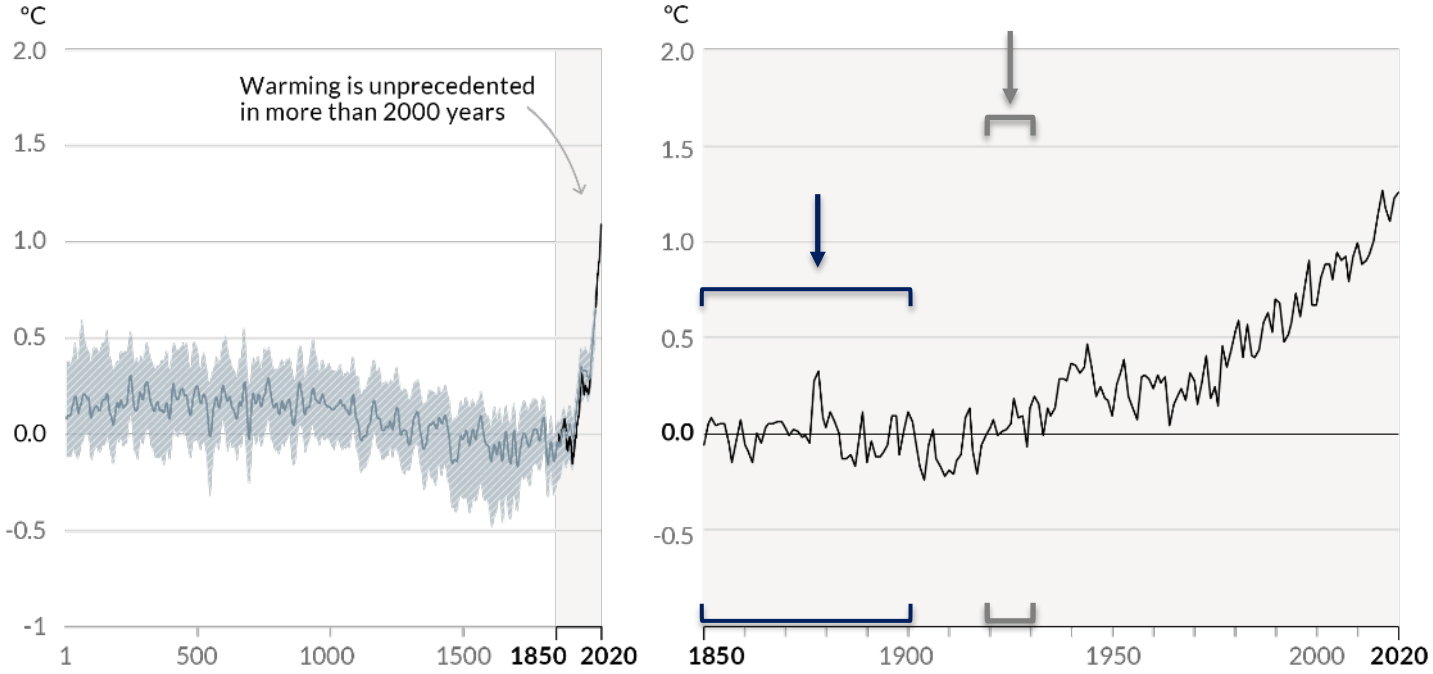
**46** countries commented on Final Government Distribution

[Credit: NASA]

“Recent changes in the climate are widespread, rapid, and intensifying, and unprecedented in thousands of years.

# Human influence has warmed the climate at a rate that is unprecedented in at least the last 2000 years

Changes in global surface temperature relative to 1850-1900



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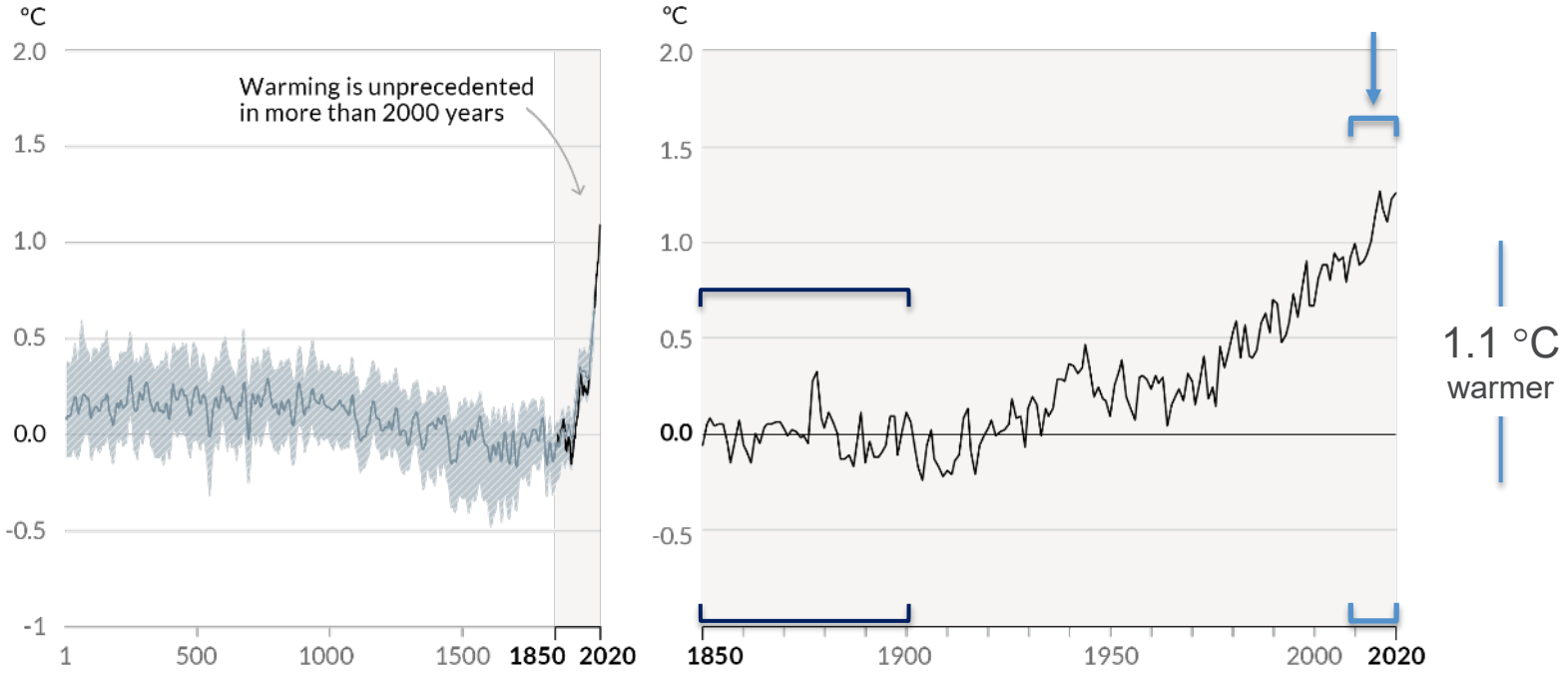

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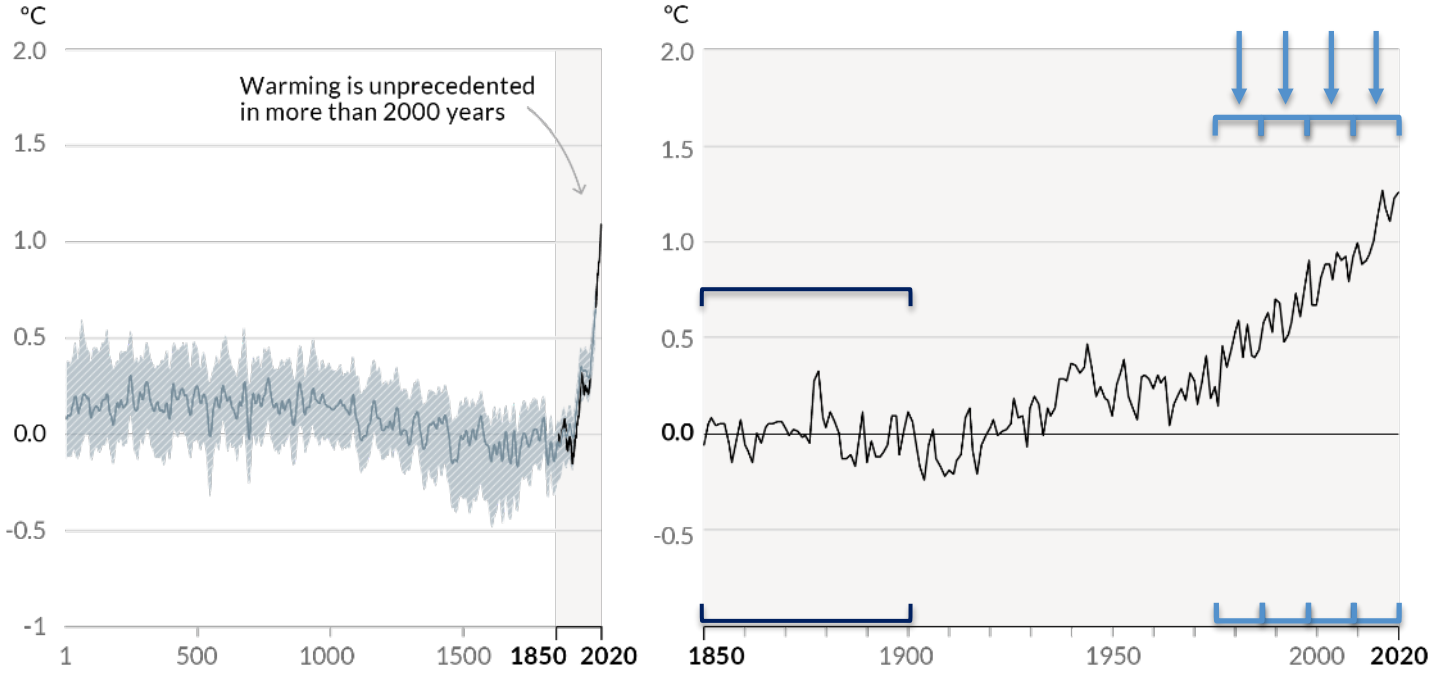

# Human influence has warmed the climate at a rate that is unprecedented in at least the last 2000 years

*Figure SPM.1*

## Changes in global surface temperature relative to 1850-1900

a) Change in global surface temperature (decadal average) as reconstructed (1-2000) and **observed** (1850-2020)

b) Change in global surface temperature (annual average) as **observed** and simulated using human & natural and only natural factors (both 1850-2020)

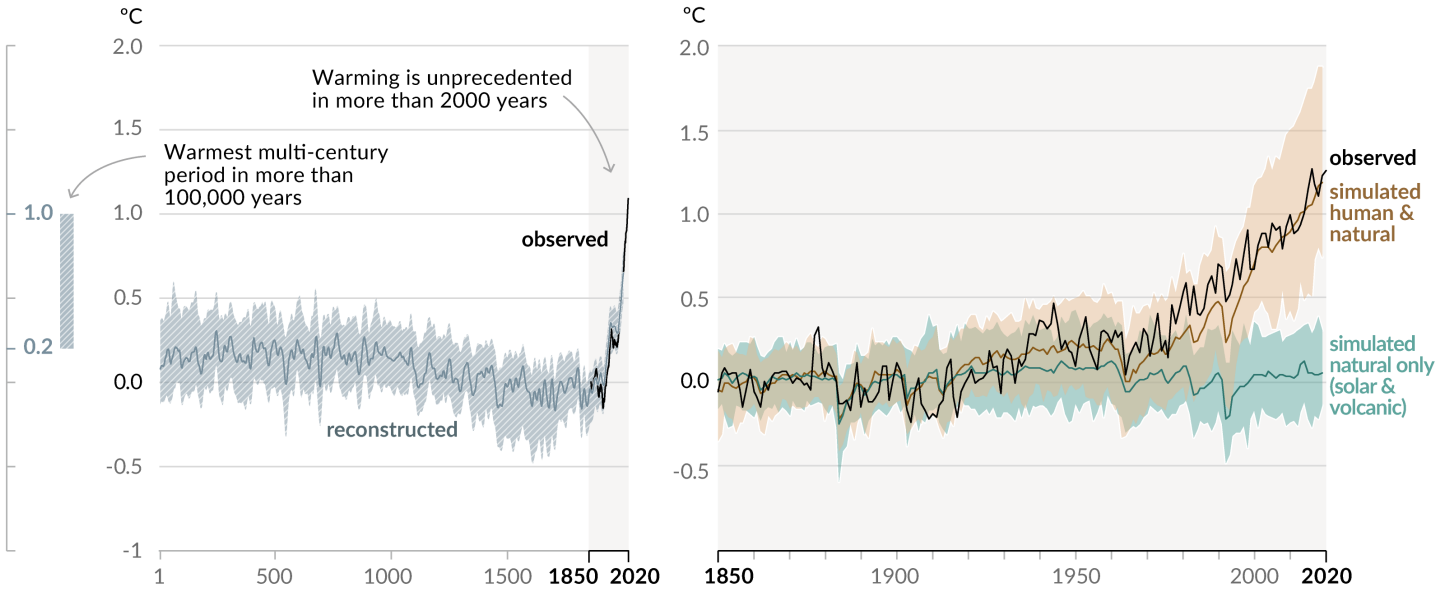

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*Figure SPM.1*

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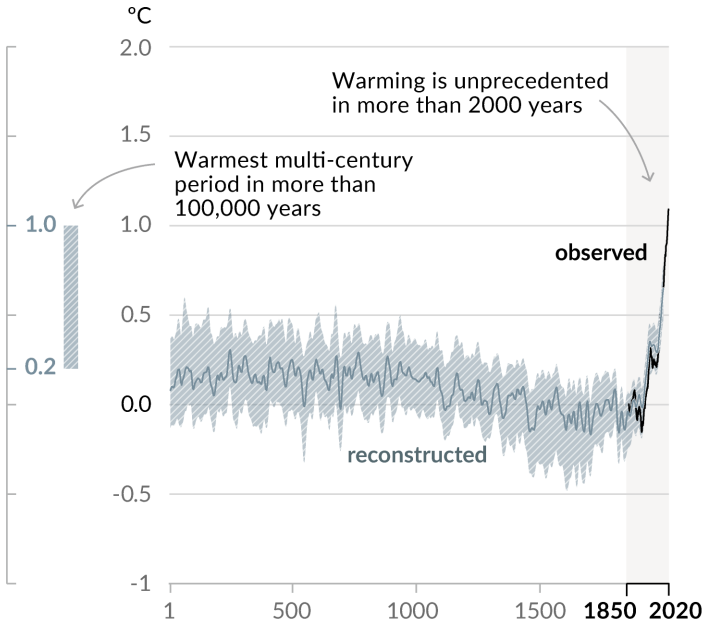

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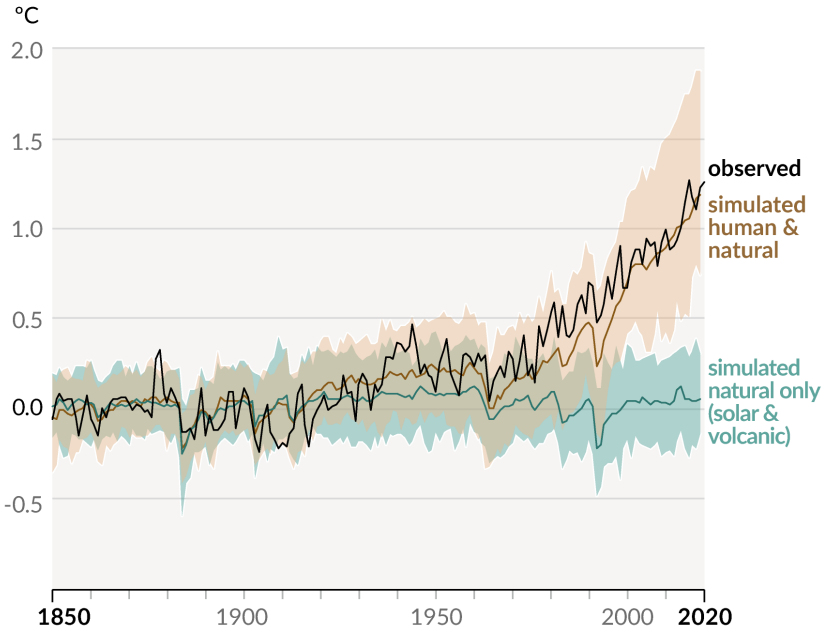
b) Change in global surface temperature (annual average) as **observed** and simulated using **human & natural** and **only natural** factors (both 1850-2020)



[Credit: Hong Nguyen | Unsplash]

“Climate change is already affecting every region on Earth, in multiple ways.

The changes we experience will increase with further warming.

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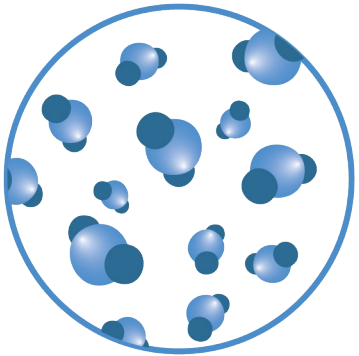
**$CO_2$** concentration



**Highest**

in at least

**2 million years**

**Sea level** rise

**Fastest rates**

in at least

**3000 years**

**Arctic sea ice** area

**Lowest level**

in at least

**1000 years**

**Glaciers** retreat

**Unprecedented**

in at least

**2000 years**

**Extreme heat**

More frequent

More intense

**Heavy rainfall**

More frequent

More intense

**Drought**

Increase in some regions

**Fire weather**

More frequent

**Ocean**

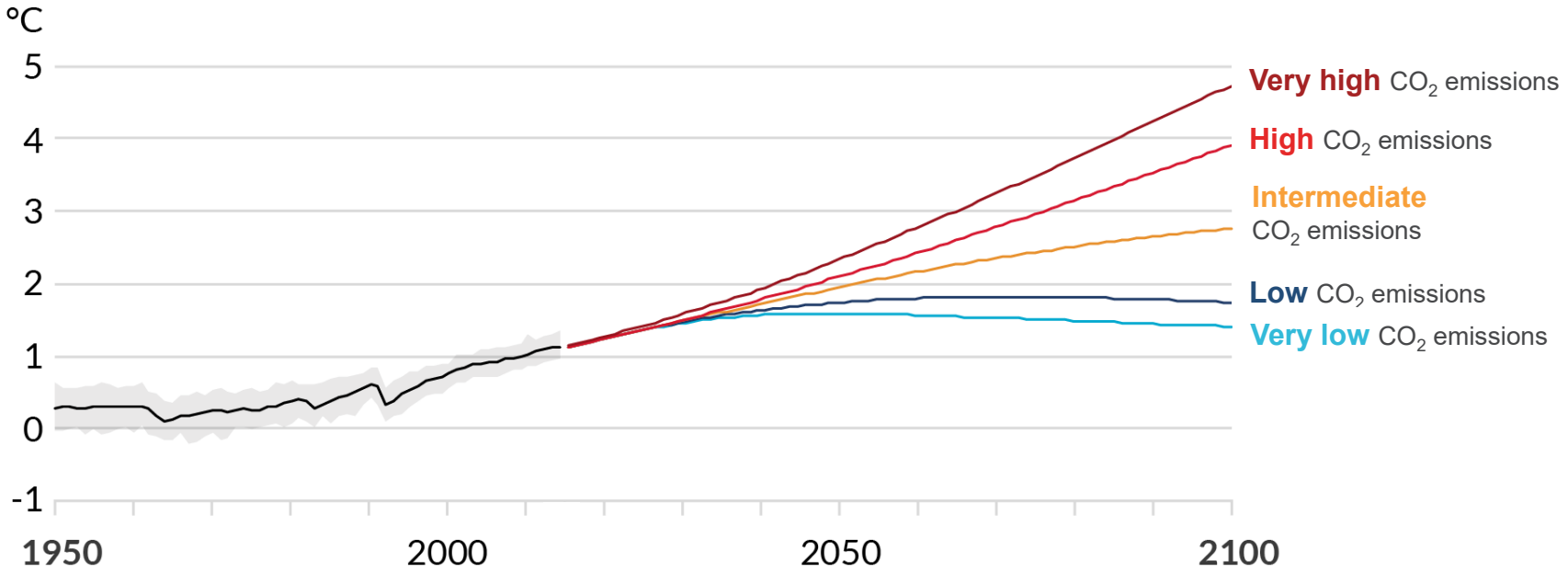
Warming
Acidifying
Losing oxygen

Photo Credits from left: 1. Luiz Guimaraes 2. Jonathan Ford 3. Peter Burdon 4. Ben Kuo 5. NOAA

[Credit: Peter John Maridable]

> “Unless there are immediate, rapid, and large-scale reductions in greenhouse gas emissions, limiting warming to 1.5°C will be beyond reach.

# Future emissions cause future additional warming



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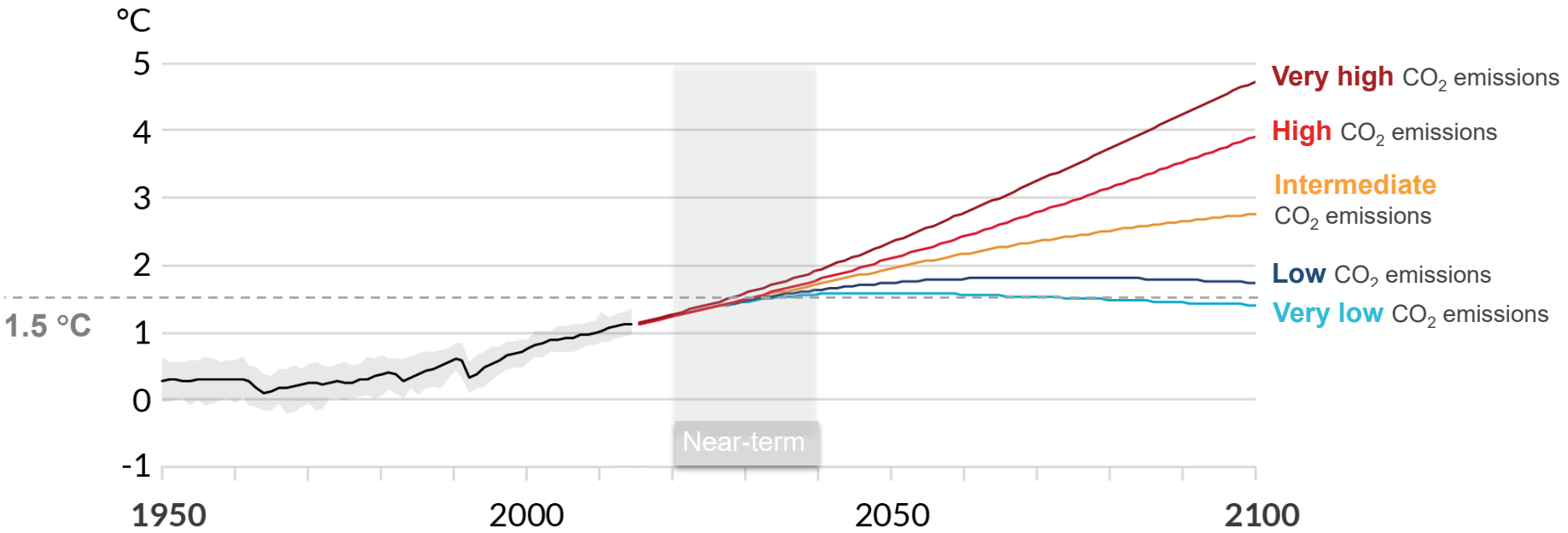

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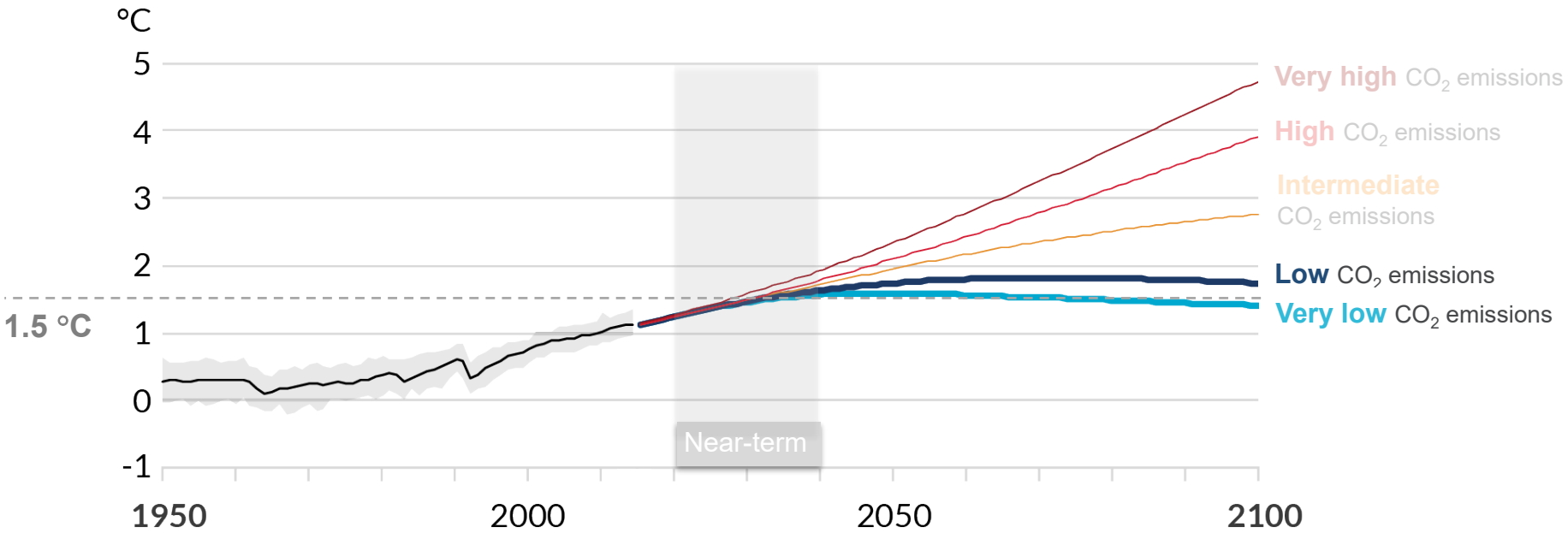

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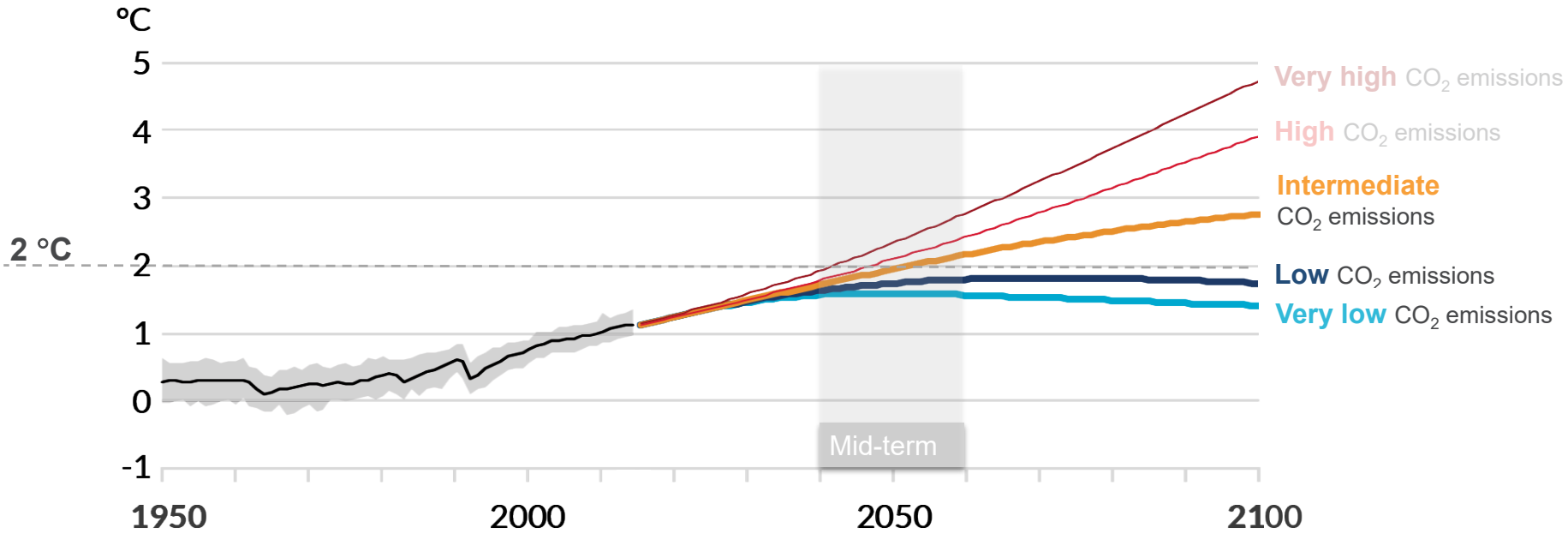
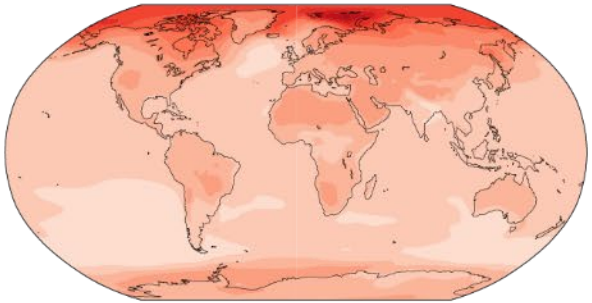


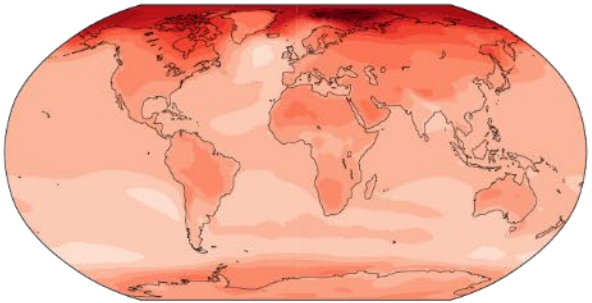
# With every additional amount of global warming, changes get larger.

Simulated changes…

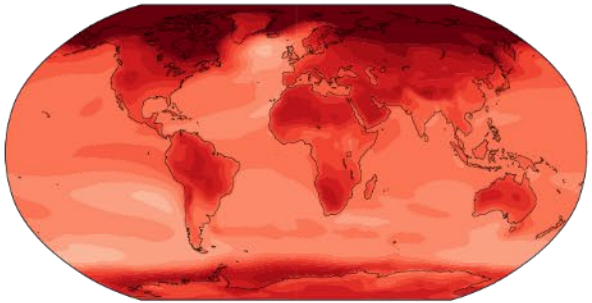
…at 1.5°C

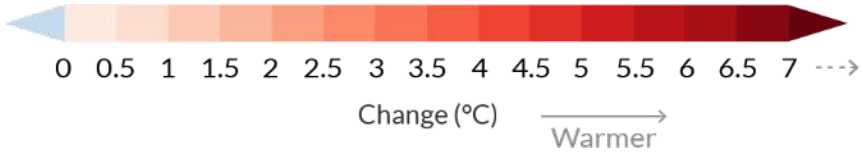


…at 2°C



…at 4°C

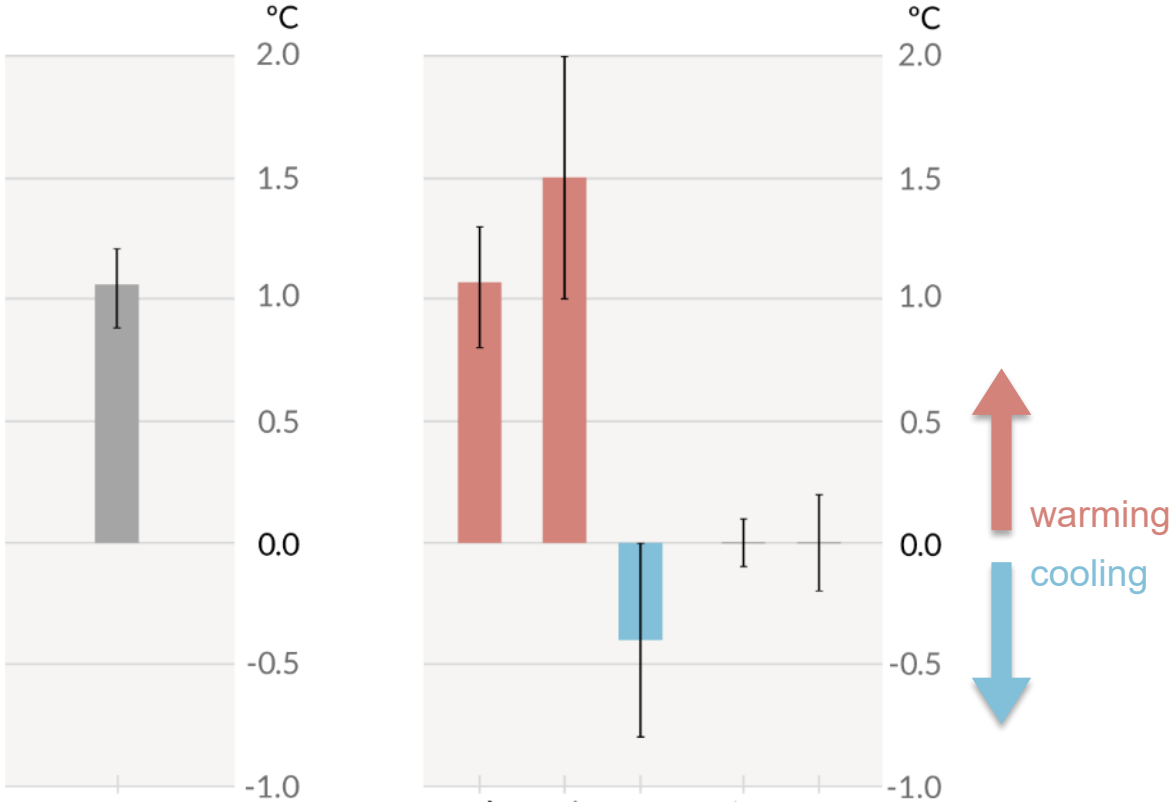




[Credit: Yoda Adaman | Unsplash]

> It is indisputable that human activities are causing climate change, making extreme climate events, including heat waves, heavy rainfall, and droughts, more frequent and severe.

**Observed warming** is driven by emissions from **human activities**, with **greenhouse gas** warming partly masked by **aerosol cooling**



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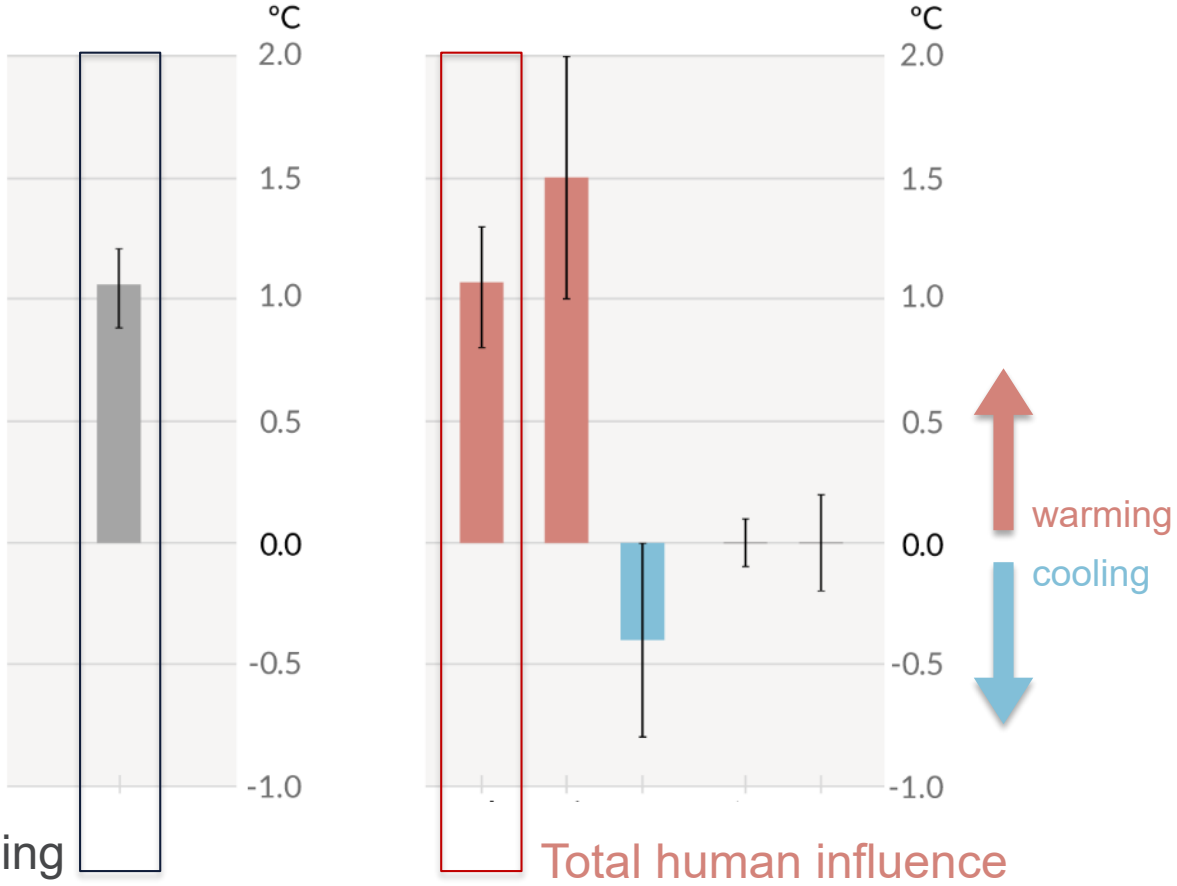

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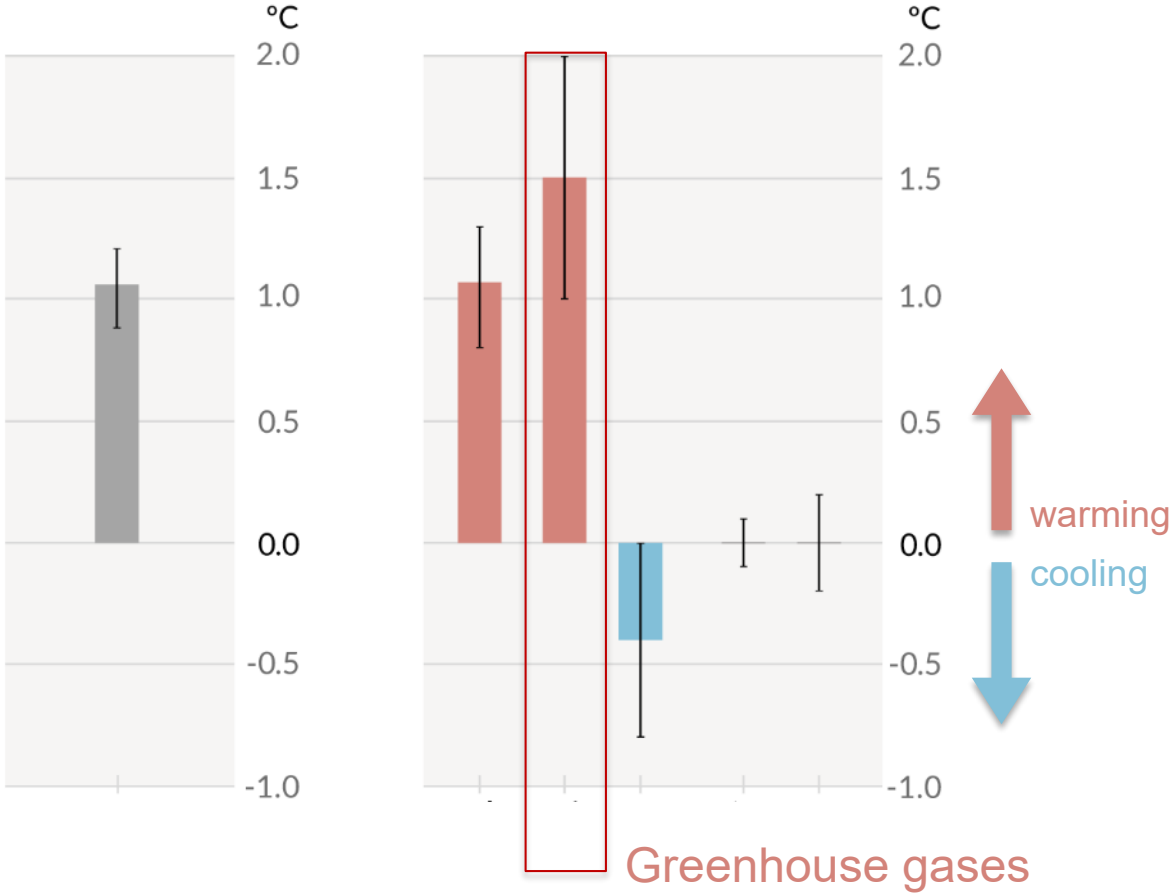

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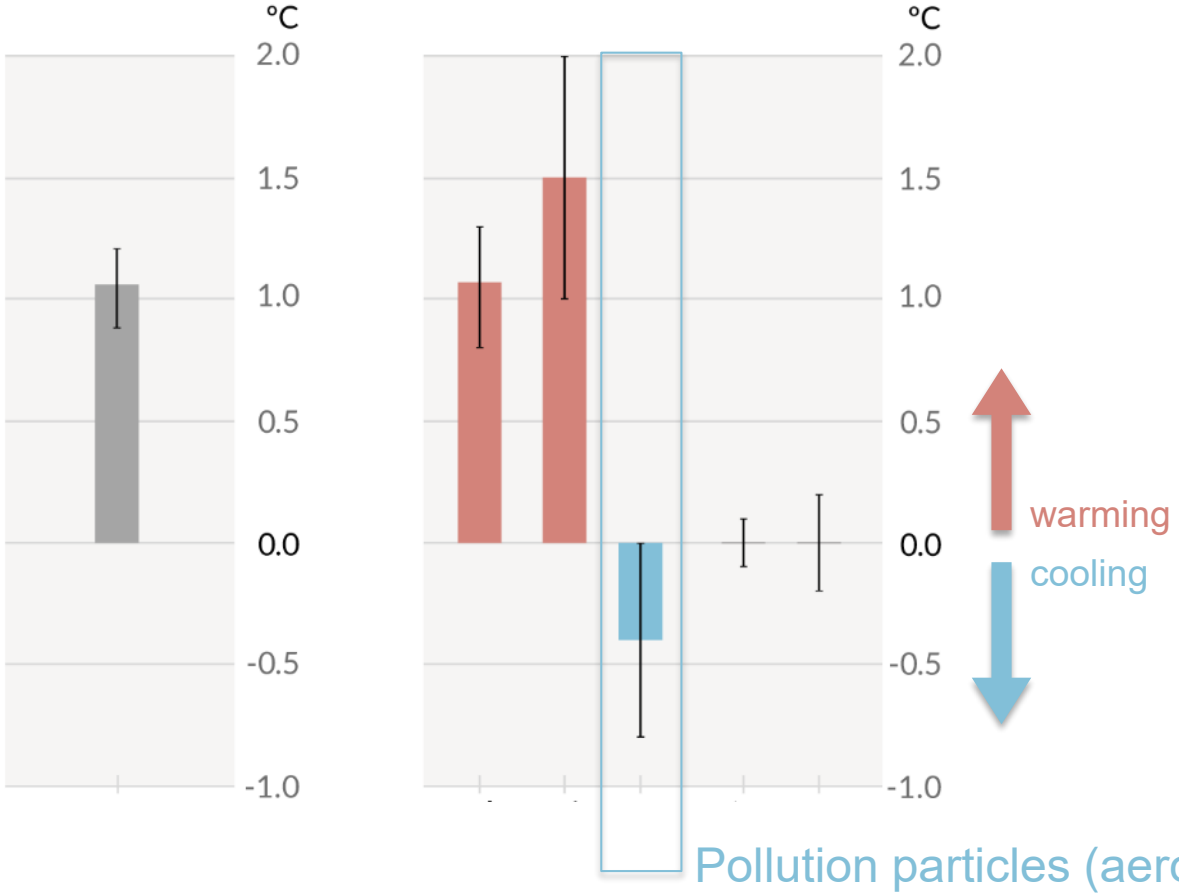

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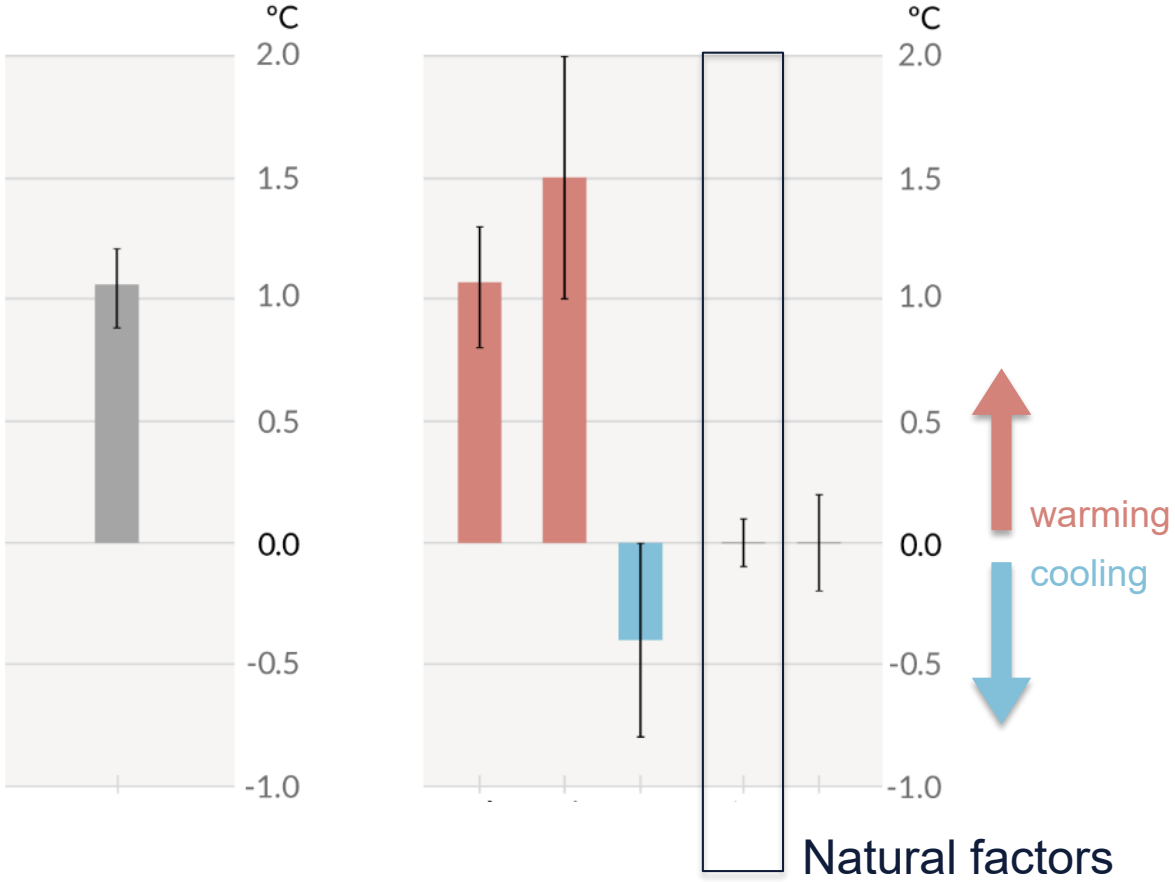

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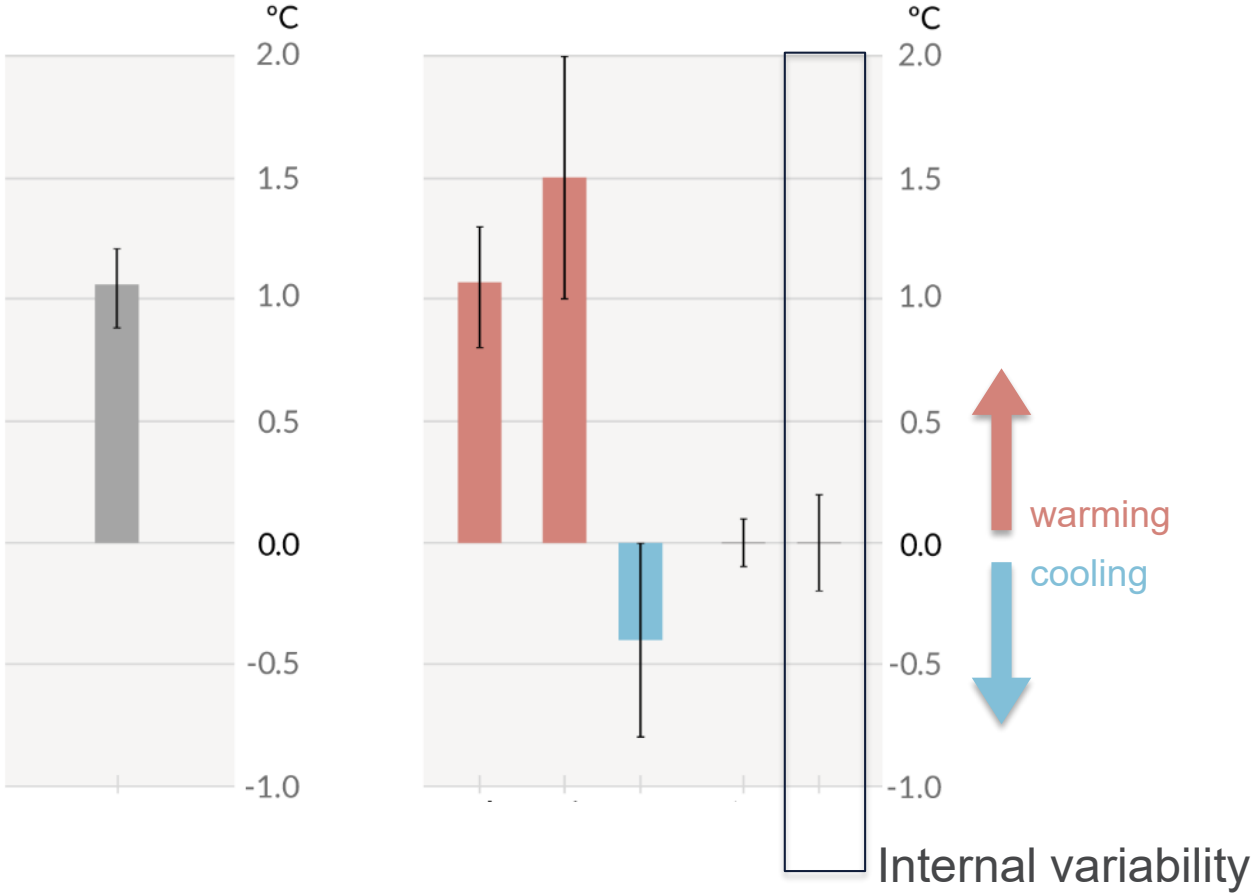


# Human influence, main driver of…

- …**Hot extremes,** which have become more **frequent** and more **intense**

Photo Credit: Chris JL / flickr

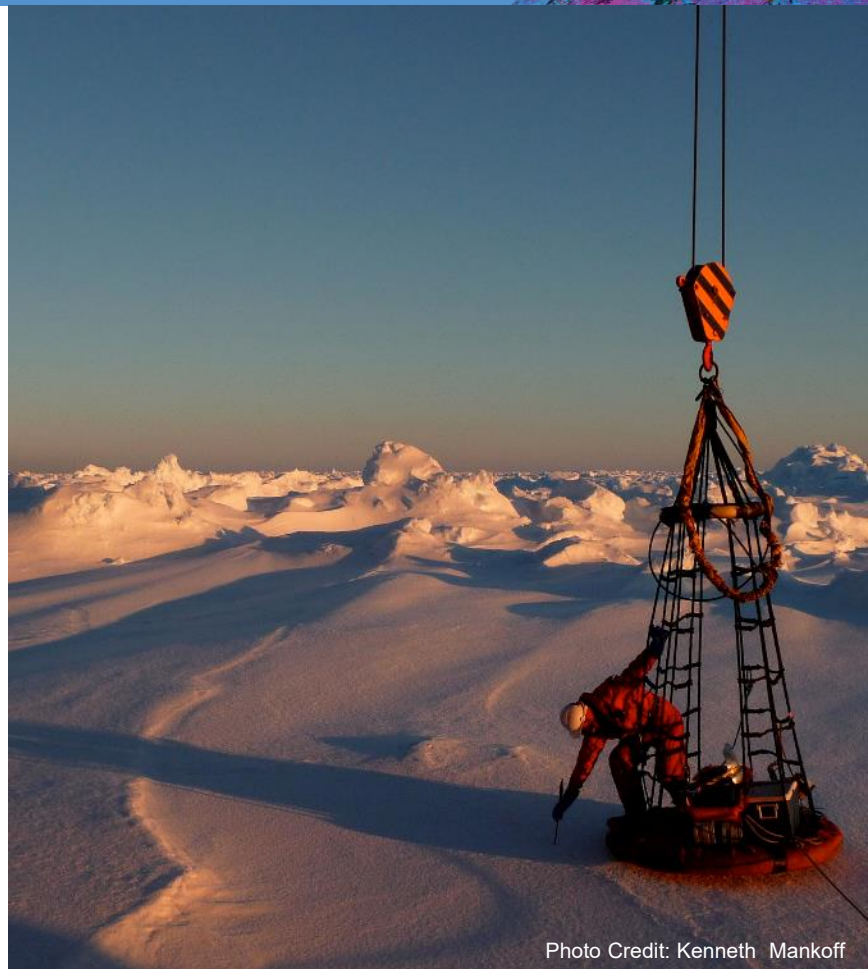
# Human influence, main driver of…

- **…Hot extremes,** which have become more **frequent** and more **intense**
- …**ocean warming** since the 1970s, and **ocean acidification**.


Photo Credit: Baptiste Azais

# Human influence, main driver of…

- **…Hot extremes,** which have become more **frequent** and more **intense**
- …**ocean warming** since the 1970s, and **ocean acidification**.
- …changes we see in the **frozen areas** of the planet:



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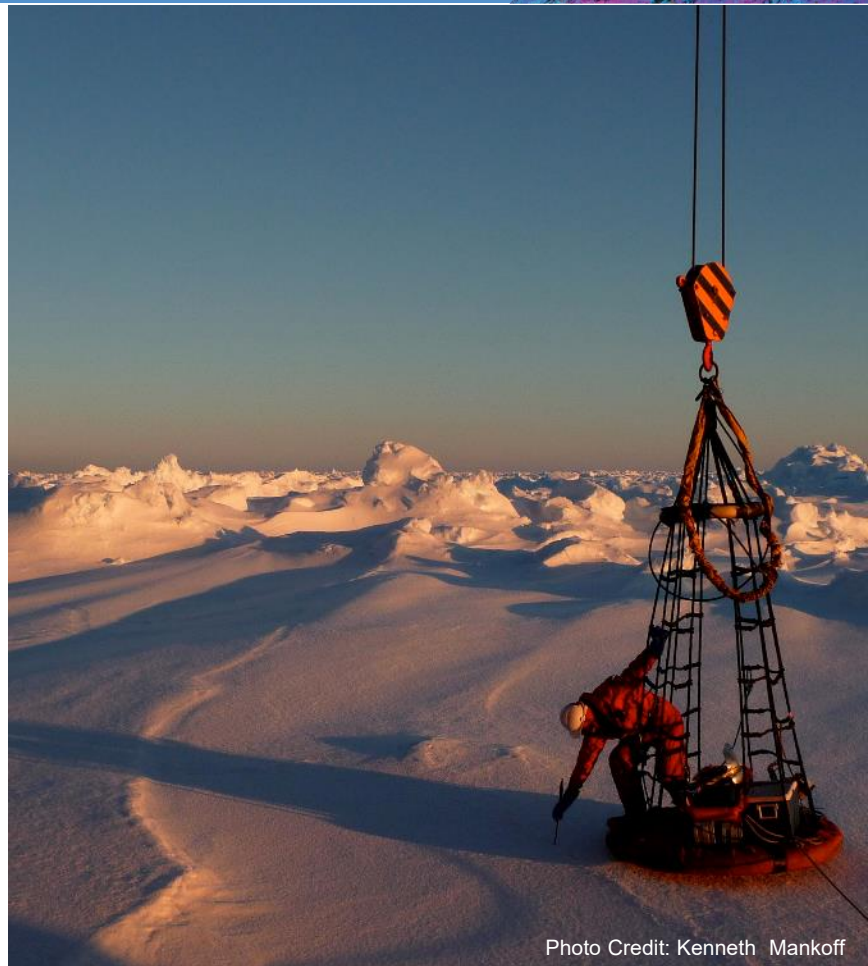
  ⇨ global retreat of glaciers since the 1990



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- …changes we see in the **frozen areas** of the planet:
  - ⇨ global retreat of glaciers since the 1990s
  - ⇨ 40% decrease in Arctic sea ice since 1979


Photo Credit: Andy Mahoney

# Human influence, main driver of…

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- …**ocean warming** since the 1970s, and **ocean acidification**.
- …changes we see in the **frozen areas** of the planet:
  - ⇨ global retreat of glaciers since the 1990s
  - ⇨ 40% decrease in Arctic sea ice since 1979
  - ⇨ decrease in spring snow cover since the 1950s.

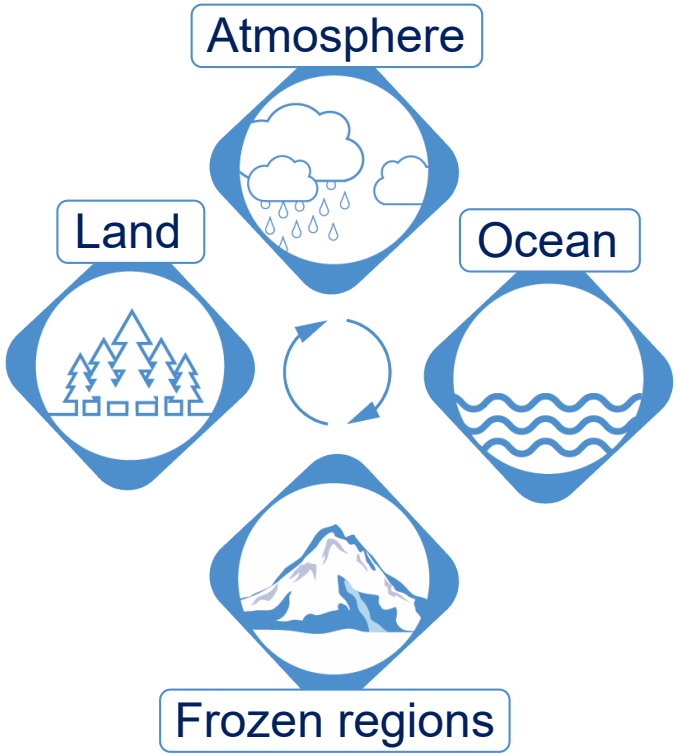

Photo Credit: Andy Mahoney

[Credit: Hong Nguyen | Unsplash]

“Climate change is already affecting every region on Earth, in multiple ways.

The changes we experience will increase with further warming.

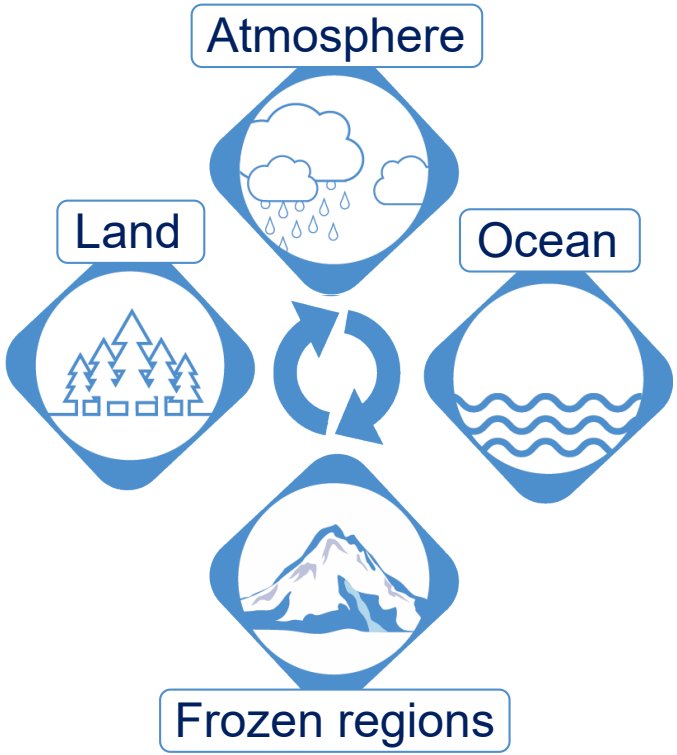
# Changes to the Water cycle




## With warmer temperature

- Atmosphere can hold more water
- More and faster evaporation
- Heavier precipitation

# Changes to the Water cycle




**More global warming**

- Heavier rainfall
- Intensifying dry seasons and droughts

# Rainfall and Monsoon


## Annual Rainfall on Land

Increasing

## Monsoons

Changing in complex ways

Photos: Left: Arek Socha, Pixabay: Right: James Martin Phelps

[Credit: Jenn Caselle | UCSB]

“There’s no going back from some changes in the climate system…

# Ocean and ice sheets

**Ocean temperature**

Increasing

**Greenland Ice Sheet**

Melting

**Sea level**

Rising

Photo Credits from left: NOAA; Konrad Steffen; Allan Grinberg

[Credit: Andy Mahoney | NSIDC]

"…However, some changes could be slowed and others could be stopped by limiting warming.

[Credit: Shari Gearheard | NSIDC]

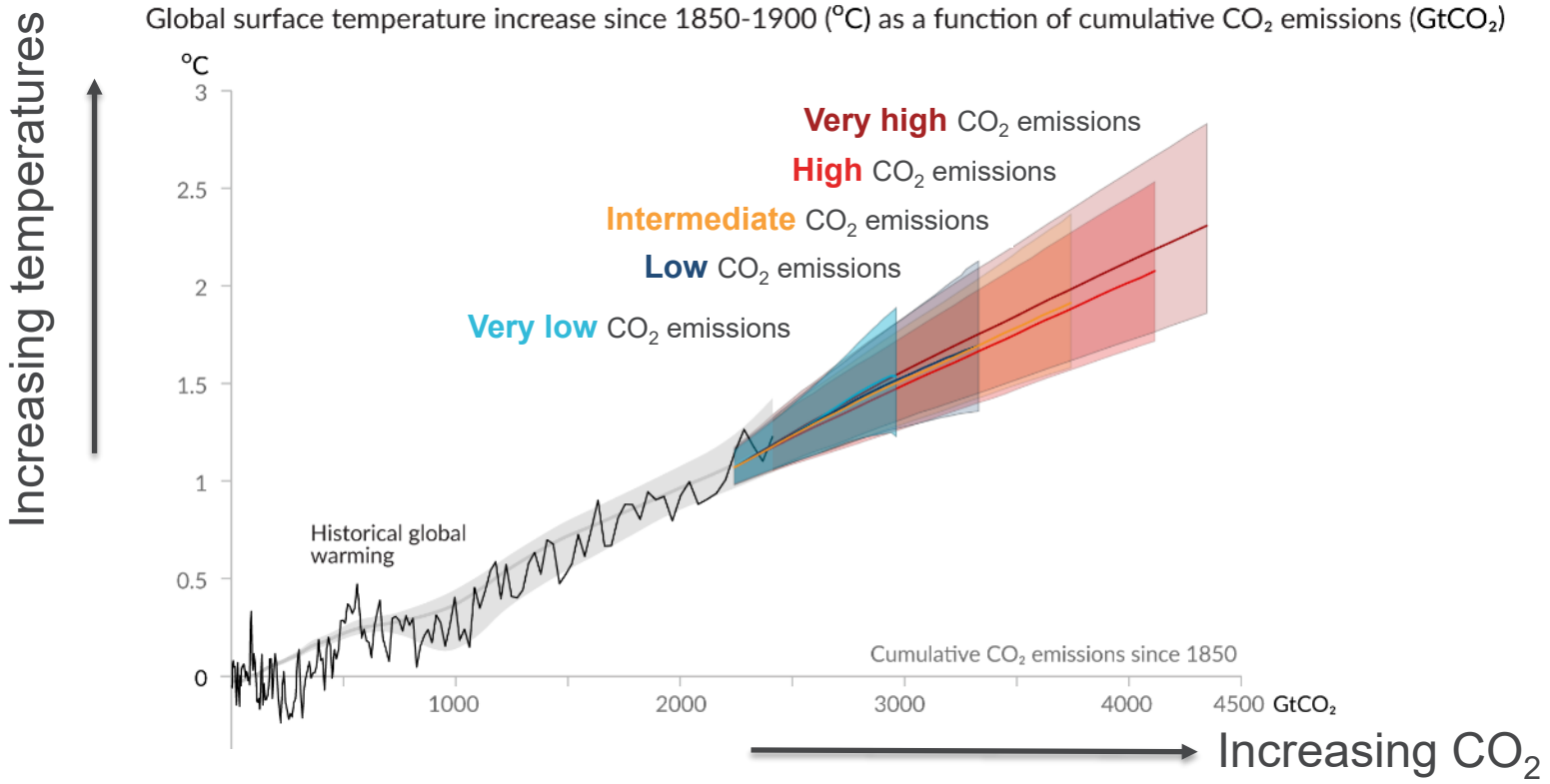
> “There’s no going back from some changes in the climate system. However, some changes could be slowed and others could be stopped by limiting warming.

[Credit: evgeny-nelmin.]

“To limit global warming, strong, rapid, and sustained reductions in $CO_2$, methane, and other greenhouse gases are necessary.

This would not only reduce the consequences of climate change but also improve air quality.

# Every tonne of $CO_2$ emissions adds to global warming



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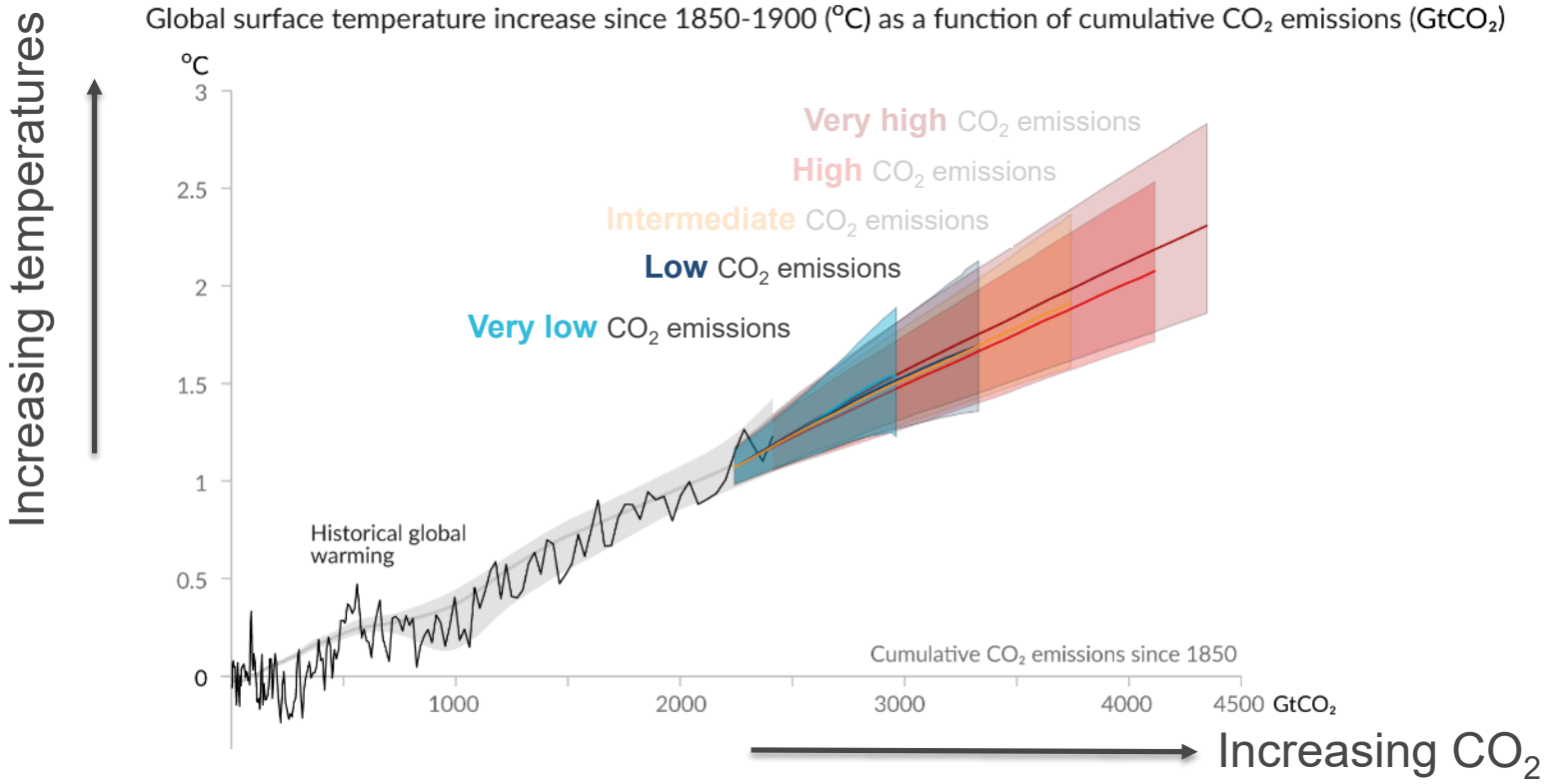
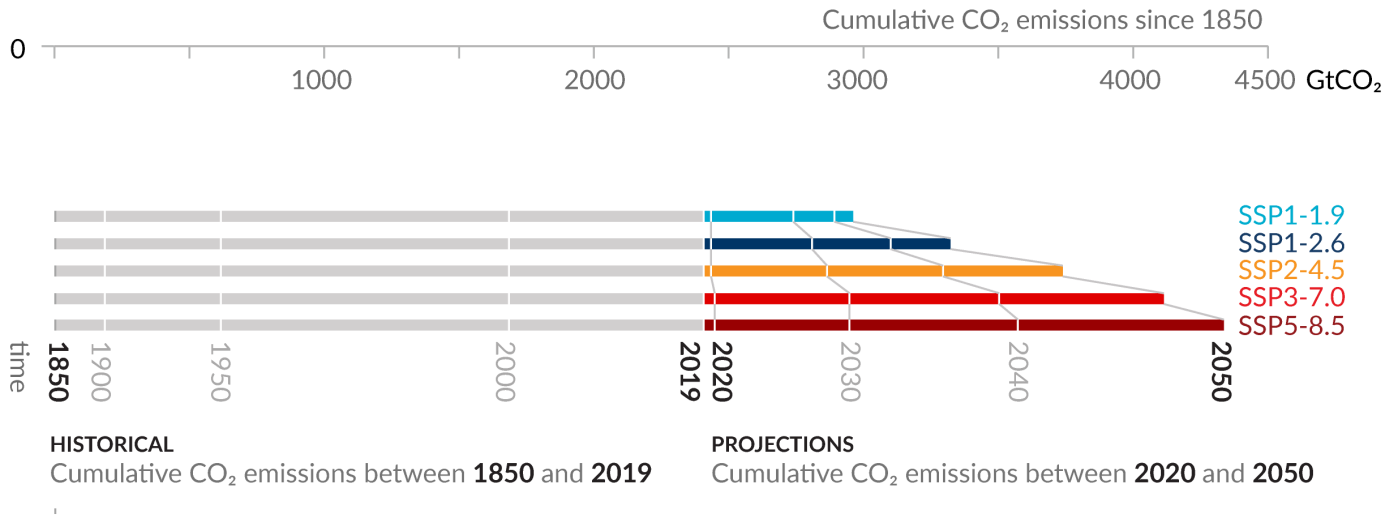


# Every tonne of $CO_2$ emissions adds to global warming

*Figure SPM.10*

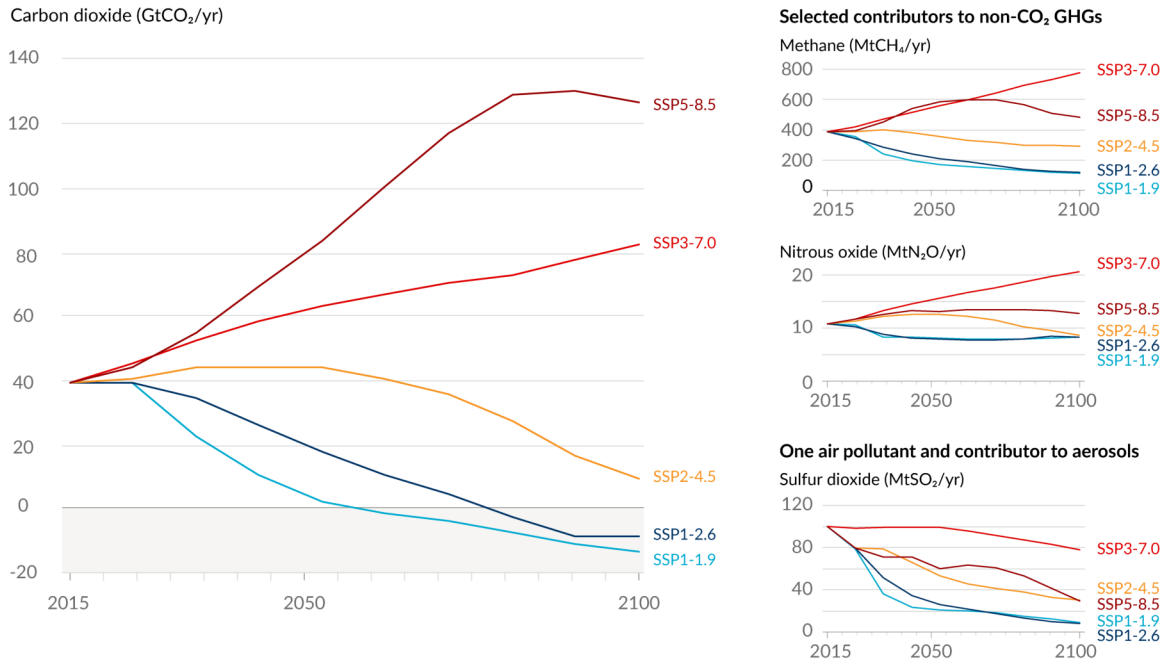



Future cumulative $CO_2$ emissions differ across scenarios, and determine how much warming we will experience

# Future emissions cause future additional warming, with total warming dominated by past and future $CO_2$ emissions

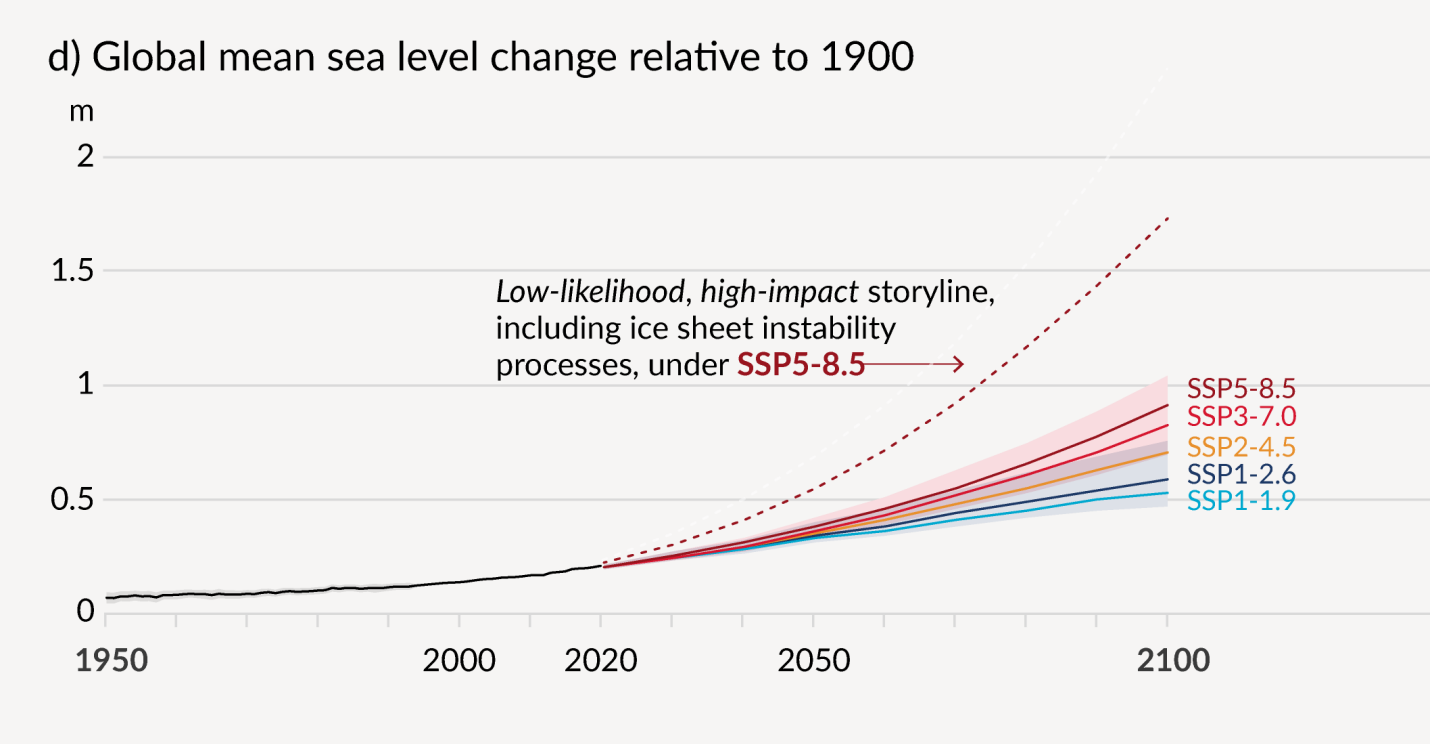
*Figure SPM.4*

**a) Future annual emissions of $CO_2$ (left) and of a subset of key non-$CO_2$ drivers (right), across five illustrative scenarios**



# Human activities affect all the major climate system components, with some responding over decades and others over centuries

*Figure SPM.8*



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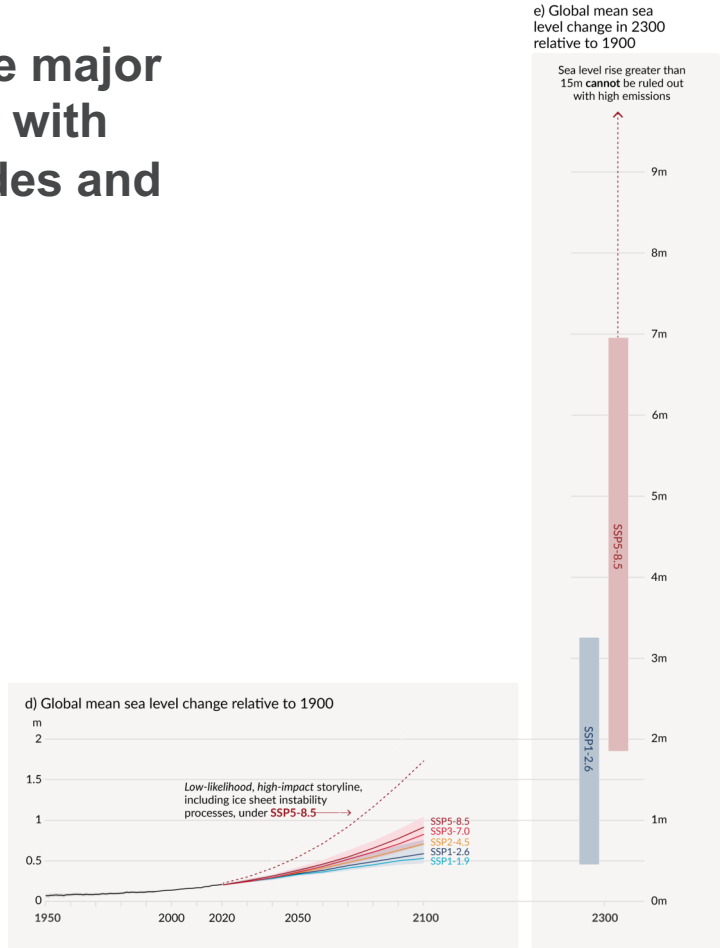


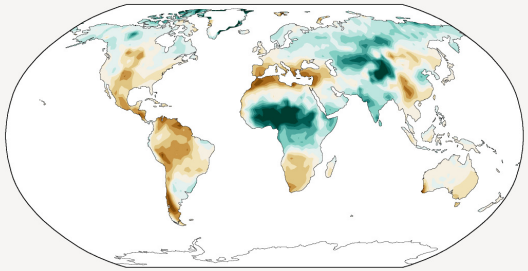
# With every increment of global warming, changes get larger in regional mean temperature, precipitation and soil moisture

*Figure SPM.5*

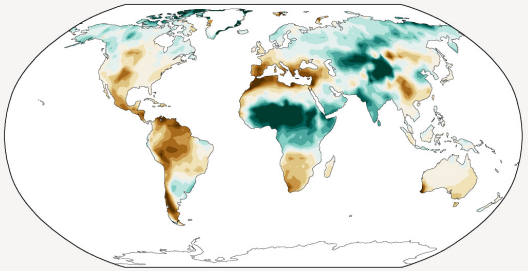
## d) Annual mean total column soil moisture change (standard deviation)

Across warming levels, changes in soil moisture largely follow changes in precipitation but also show some differences due to the influence of evapotranspiration.

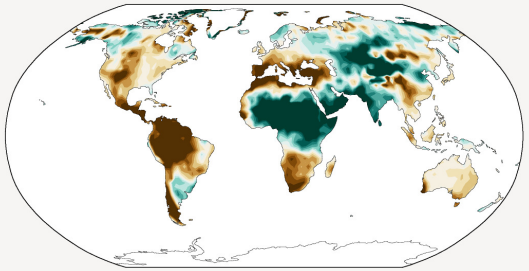
Simulated change at **1.5 °C** global warming



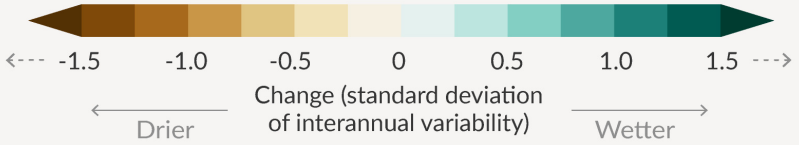
Simulated change at **2 °C** global warming

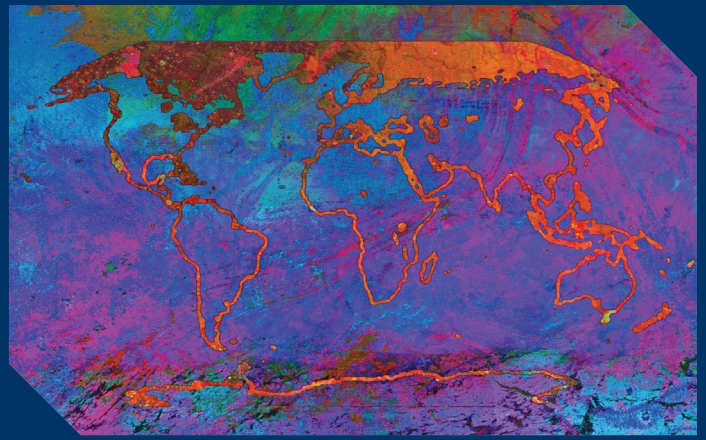


Simulated change at **4 °C** global warming



Relatively small absolute changes may appear large when expressed in units of standard deviation in dry regions with little interannual variability in baseline conditions





“ The climate we experience in the future depends on our decisions now.

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# Thank you.

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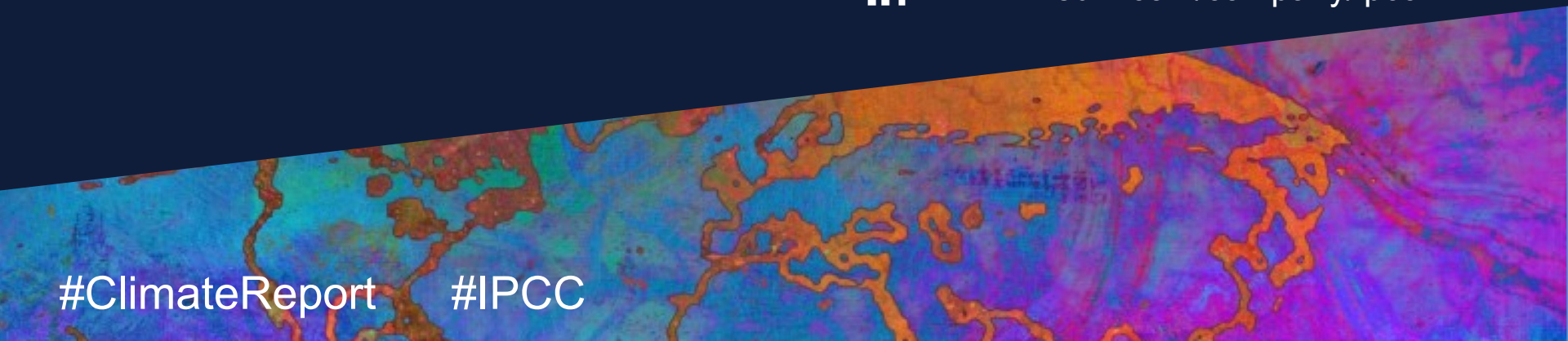

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