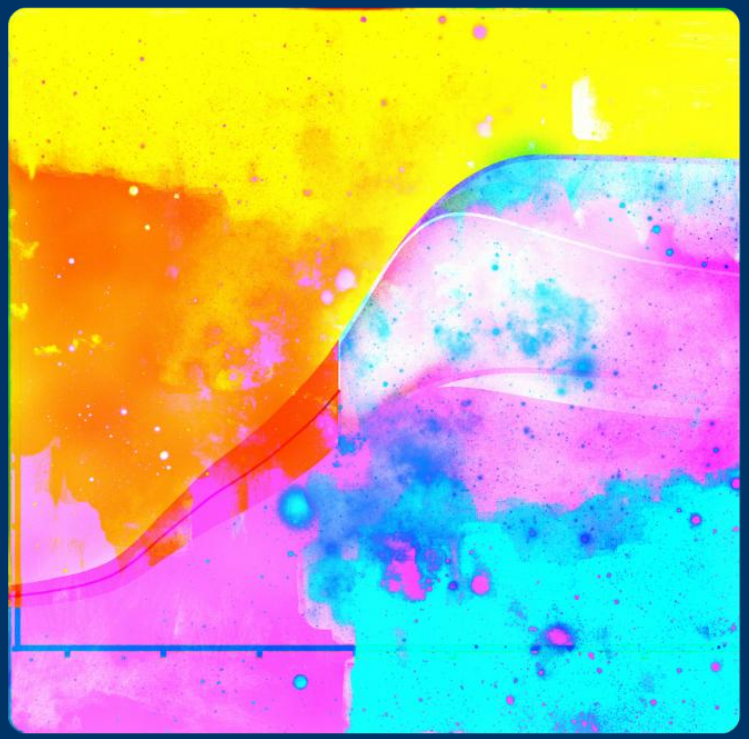


IPCC Special Report on Global Warming of 1.5°C

Avoided Impacts: Guiding AMBITION in mitigation and adaptation

Hans-O. Pörtner,
CLA Ocean Systems AR5 WGII Ch. 6
AR5 Synthesis Report
Co-Chair IPCC WGII AR6

Impacts of global warming 1.5°C: Where should we go?

At 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 (…less coastal ecosystems exposed)

Jason Florio / Aurora Photos

Andre Seale / Aurora Photos

Where do we want to go?

At 1.5°C compared to 2°C:

- Lower impact on biodiversity and species
- Smaller reductions in yields of maize, rice, wheat crop yields
- Global population exposed to water shortages is up to 50% less (also less water shortages for ecosystems)

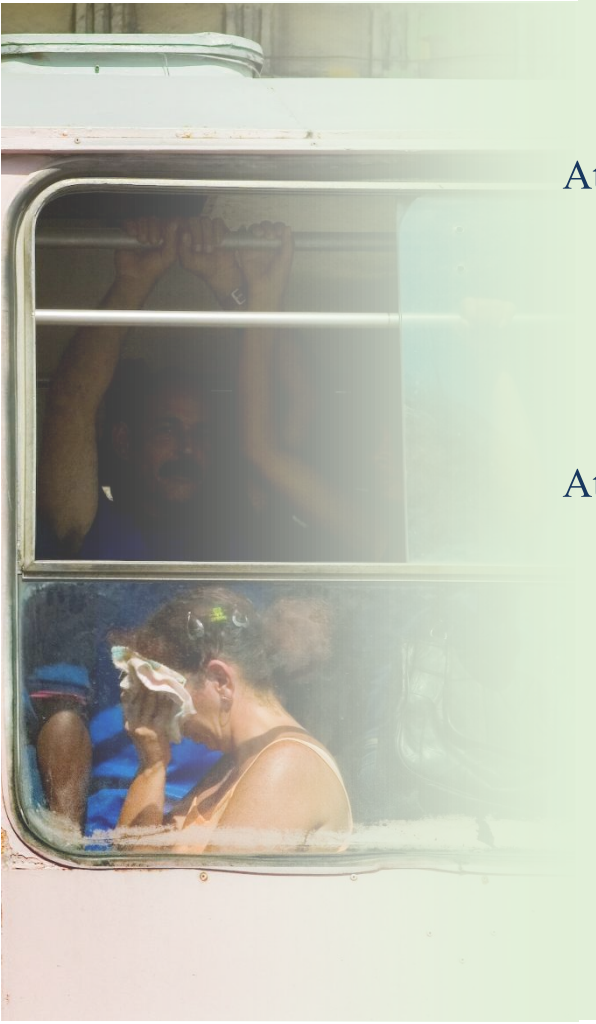
Natalie Behring / Aurora Photos

Where do we want to go?

At 1.5°C compared to 2°C:

- Lower risk to fisheries & the livelihoods that depend on them

- Up to several hundred million fewer people exposed to climate-related risk and susceptible to poverty by 2050



Where do we want to go?

At 1.5°C and 2°C:

- Disproportionately high risk for Arctic, dryland regions, small island developing states and least developed countries

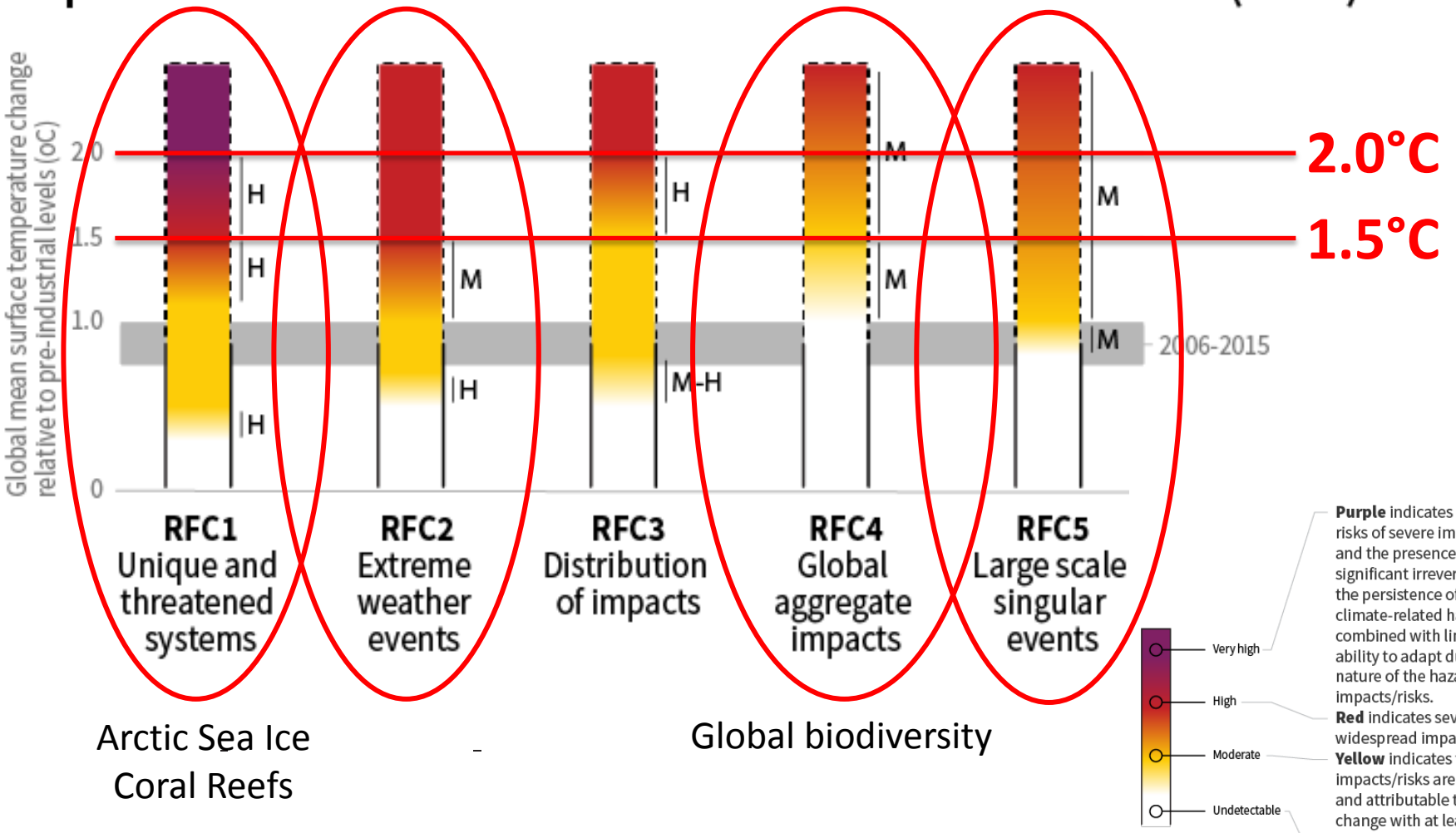
At 1.5°C compared to 2°C:

- Lower risks for health, livelihoods, food security, water supply, human security and economic growth

- A wide range of adaptation options can reduce climate risks; less adaptation needs at 1.5°C

Jason Florio / Aurora Photos

Impacts and risks associated with the Reasons for Concern (RFCs)

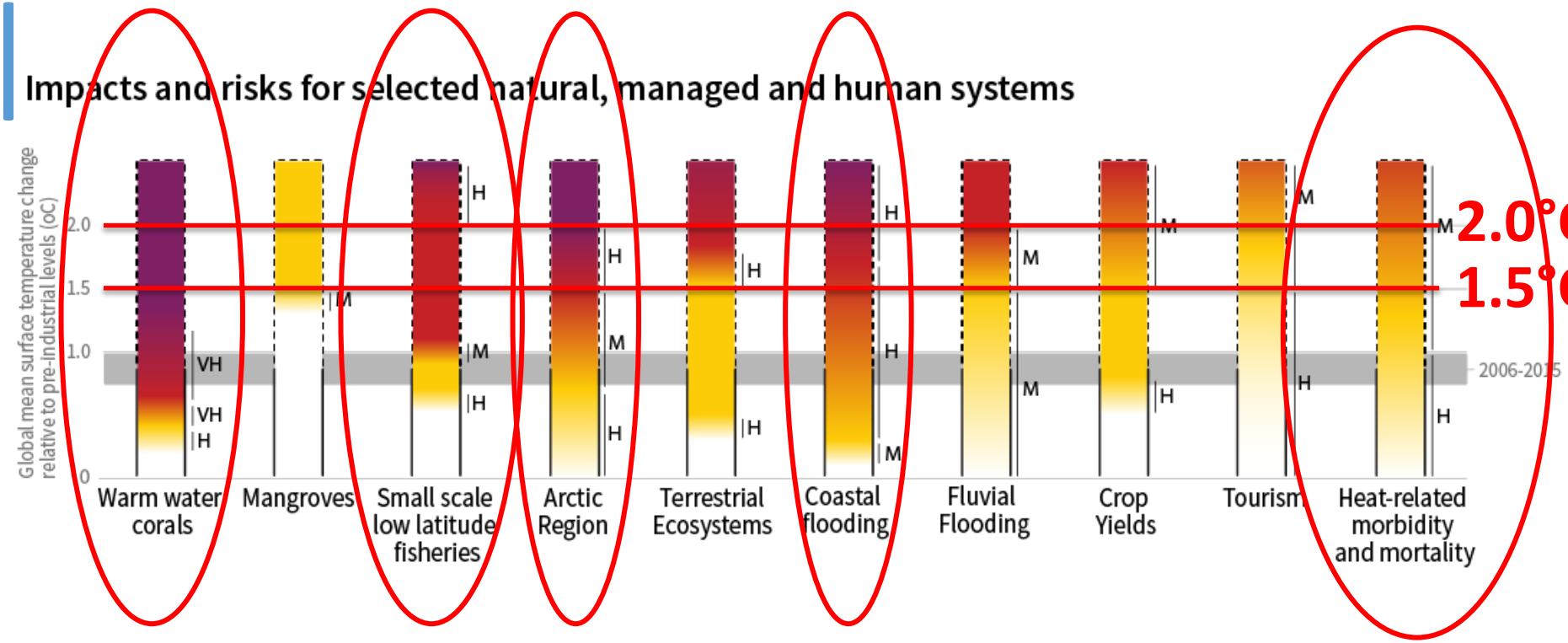


Confidence level : M, medium; H, high; VH; very high

IPCC SR1.5, 2018

….half a degree matters… every bit of warming matters….

… for ecosystems, biodiversity and humankind



…less loss and damage at 1.5°C

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

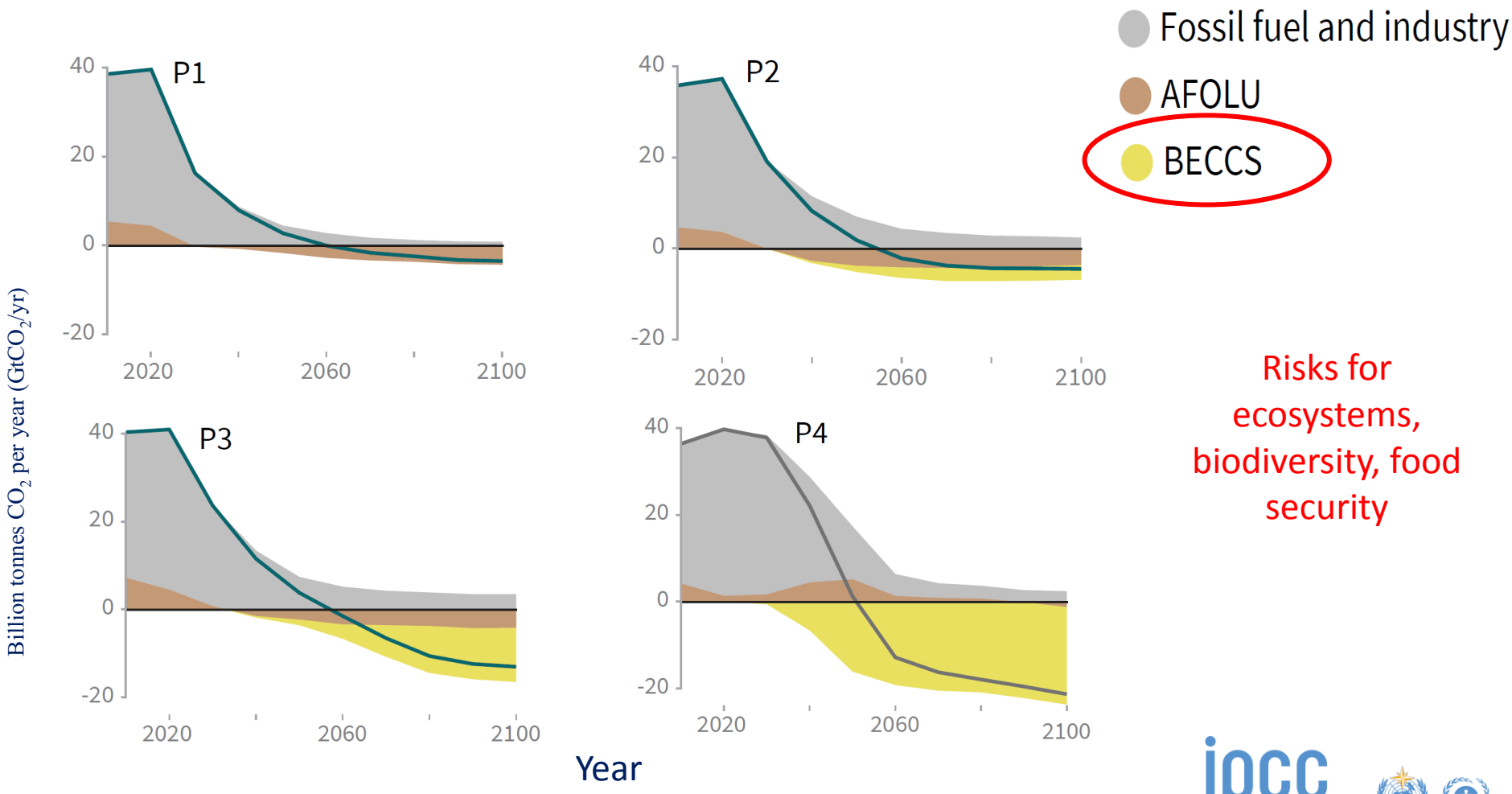
IPCC SR1.5, 2018

ipcc INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP

Different pathways and mitigation strategies could limit global warming to 1.5°C, variable needs for negative emission technologies

….bringing their own risks



Risks for ecosystems, biodiversity, food security

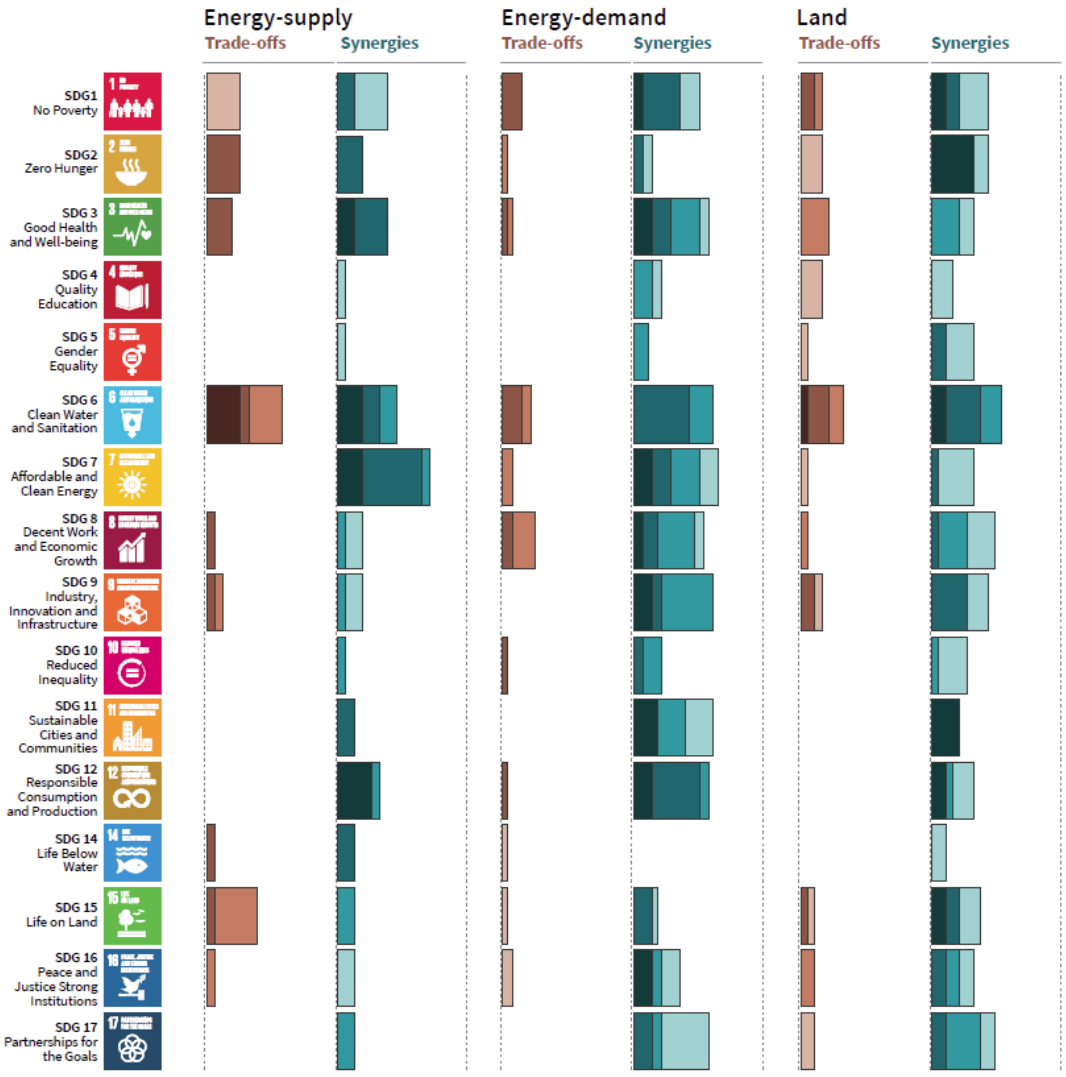
Ambitious emissions reduction minimizes the need for carbon dioxide removal, e.g. BECCS

- Co-benefits for
  - Human health
  - Ecosystem restoration and carbon storage (soils and biomass)
  - Biodiversity conservation
  - Reduced competition for land
  - Food security for humankind

Peter Essick / Aurora Photos

1.5°C facilitates reaching SDGs

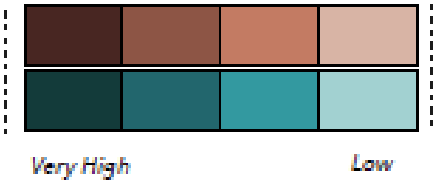
Indicative linkages between mitigation and sustainable development using SDGs (the linkages do not show costs and benefit)



1.5°C linked to reaching SDGs

Length shows strength of connection

Shades show level of confidence



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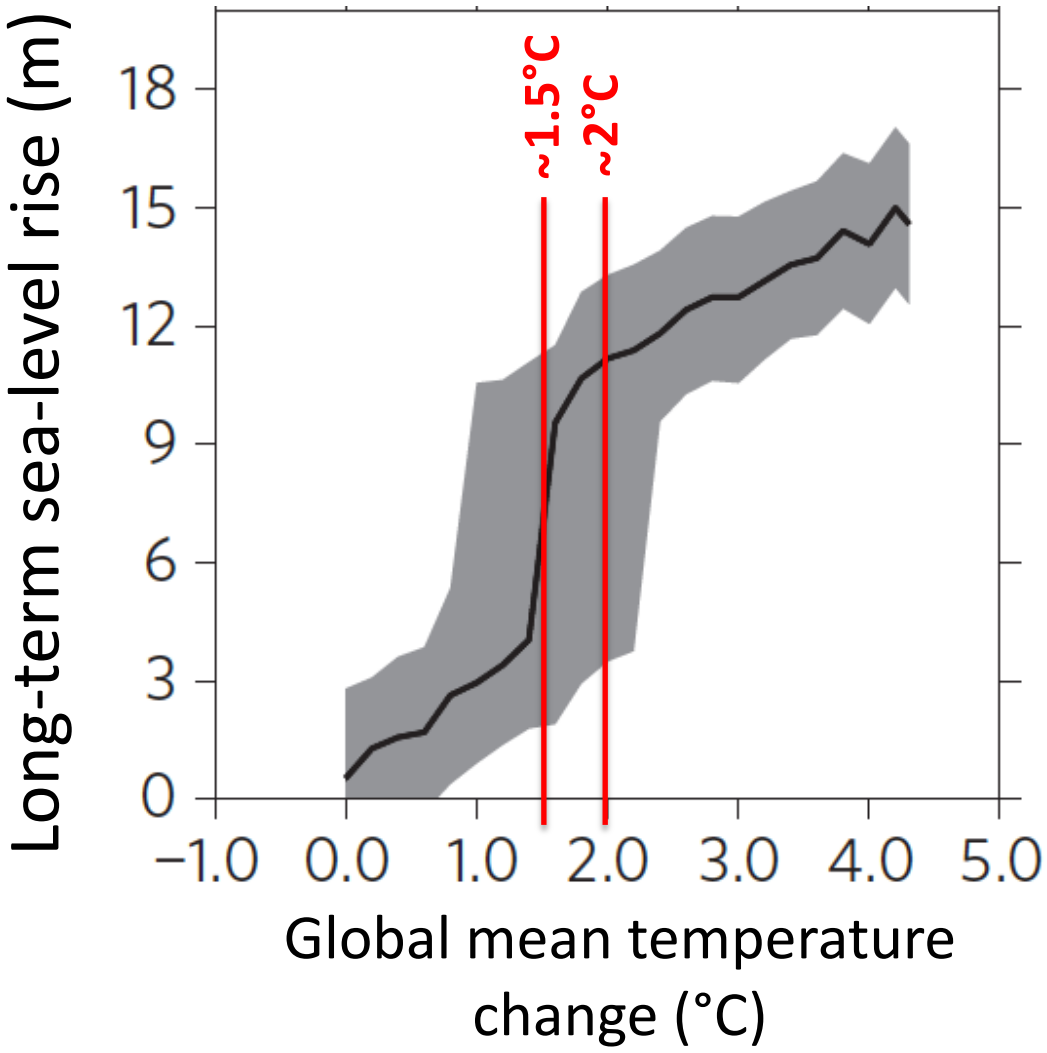
HOWEVER, irreversible sea level rise beyond 2100 may be triggered by surpassing a tipping point at 1.5 - 2°C

...emphasizing high ambition mitigation



....affecting habitat, freshwater resources, human society through flood events

Coming close to Paleo-findings....

5-9 m : ...during the last interglacial (Eemian, 125.000 ya, at 0.7-2°C above pre-industrial)

>7m : ...last time when the atmosphere had 400 ppm CO_2 (in Pliocene, 3-5 Mya)

Knutti et al., Ngeo 2015

TO BE ASSESSED FURTHER IN AR6

Ashley Cooper/ Aurora Photos

Half a degree… every bit of warming matters

Each year matters

Each choice matters

The Paris agreement provides a sense of urgency:
Overcoming societal and political inertia, accelerating transformation....

A common response even among those who (should) know...including us!?

Feasibility at various levels:

- **Keeping warming to 1.5 according to the laws of chemistry and physics ---- yes**
- **Technologies to support mitigation and adaptation measures ---- yes**
- **Redirection of financial flows ---- yes (stopping fossil fuel subsidies)**
- **Informed policy leading and directing societal transformation ---- may be .....? BOTTLE NECK**

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Gerhard Zwerger-Schoner / Aurora Photos

How do we get there?

- To limit warming to 1.5°C, CO_2 emissions fall by about 45% by 2030 (from 2010 levels)

  ↳ *Compared to 20% for 2°C*

- To limit warming to 1.5°C, CO_2 emissions would need to reach 'net zero' around 2050

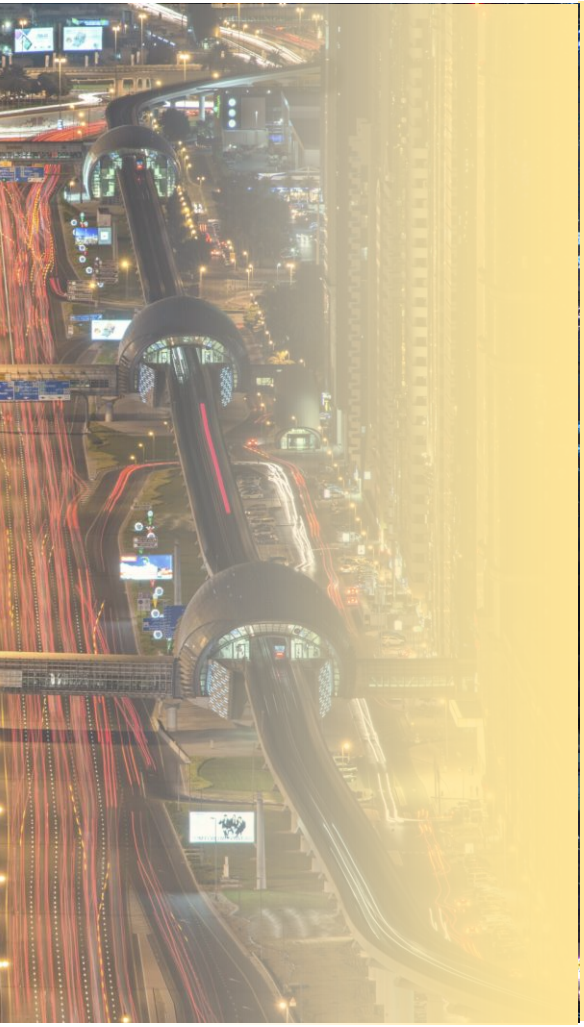
  ↳ *Compared to around 2075 for 2°C*

- Reducing non-CO_2 emissions would have direct and immediate health benefits

Ashley Cooper / Aurora Photos

Key messages

- Climate change is already affecting people, ecosystems and livelihoods all around the world
- Limiting warming to 1.5°C is not impossible but would require rapid, far-reaching and unprecedented transitions in all aspects of society
- There are clear benefits to keeping global warming to 1.5°C compared to 2°C or higher; every bit of warming matters
- Limiting warming to 1.5°C can go hand in hand with achieving other world goals



Mint Images / Aurora Photos

Limiting warming to 1.5°C

Would require rapid, far-reaching and unprecedented changes in all systems

- → A range of technologies and behavioural changes
- → Scale up in annual investment in low carbon energy and energy efficiency by factor of five by 2050
- → Renewables supply 70-85% of electricity in 2050
- → Coal declines steeply, ~zero in electricity by 2050
- → Oil and especially gas persist longer – gas use rises by 2050 in some pathways
- → Deep emissions cuts in transport and buildings
- → Changes in land use and urban planning

Thank you for your attention

For more information:

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