AVIATION CO_2 REDUCTIONS

STOCKTAKING SEMINAR

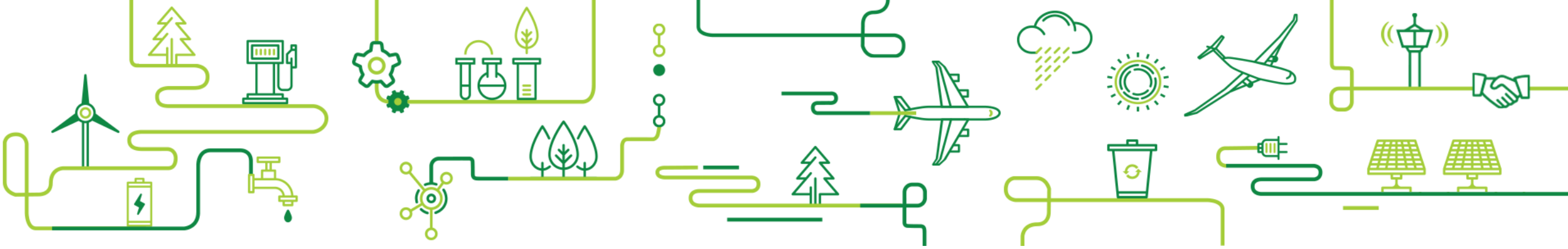
TECHNOLOGY · OPERATIONS · SUSTAINABLE AVIATION FUELS

Setting the scene: challenges, trends and energy requirements for aviation

Valérie Masson-Delmotte,

Co-Chair, IPCC Working Group I

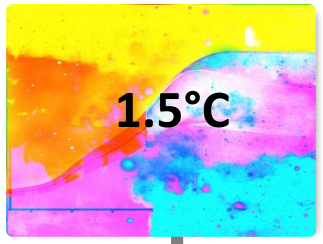
(the physical science basis of climate change)



The 6th Assessment cycle of the Intergovernmental Panel on Climate Change :

Scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts and options for adaptation and mitigation

May 2019
Emission inventories

Oct. 2018


Talanoa Dialogue COP24
UNFCCC context

Sept. 2019


August 2019

July 2021
Physical science basis

2022
Impact, adaptation and vulnerabilities

Mitigation
2022

2022
Synthesis report

Paris Agreement 2023 Global Stocktake
UNFCCC context

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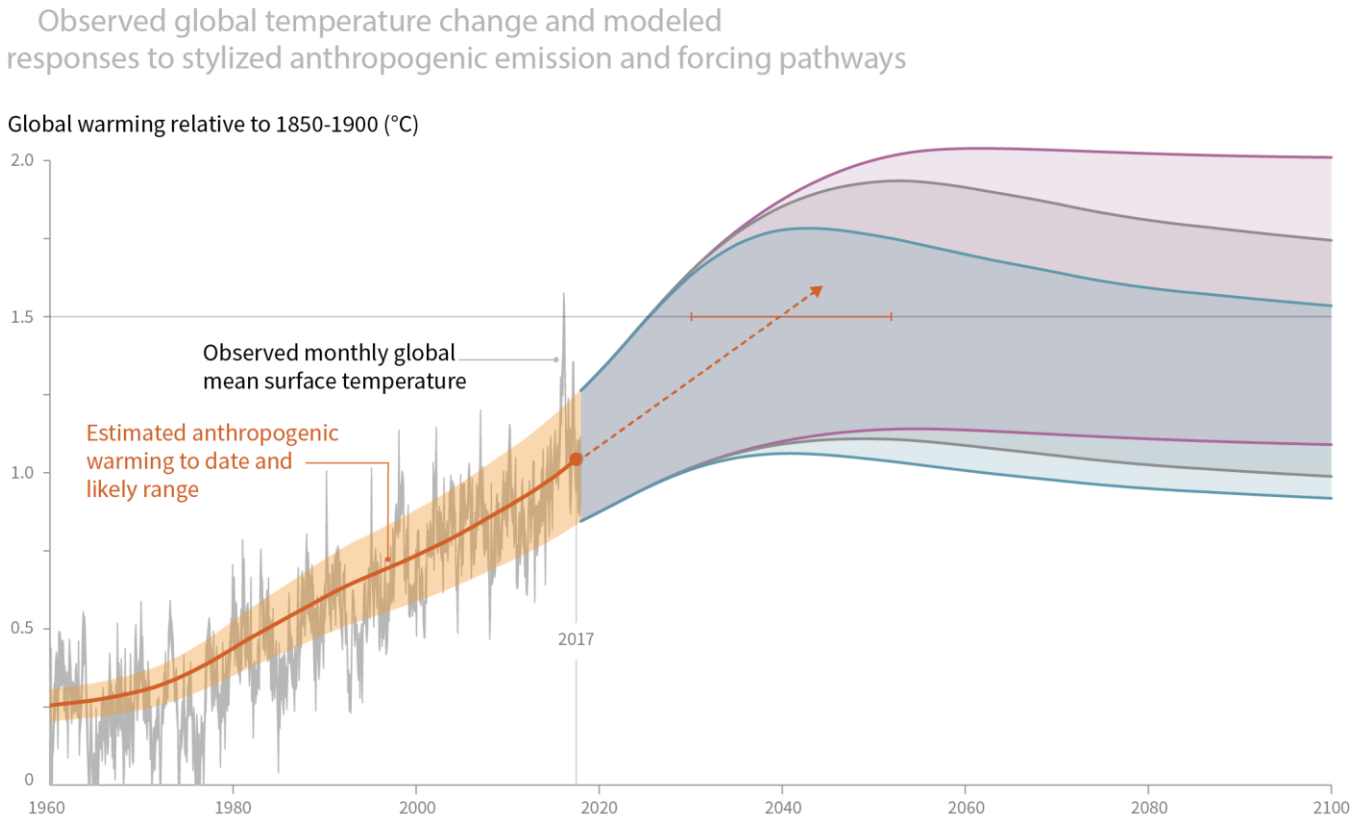
Cumulative emissions of CO_2 and future net effect of other emissions determine future global warming and climate-related risks



Pathways reflecting current nationally stated mitigation ambition until 2030 result in global warming of about 3°C by 2100, with warming continuing afterwards

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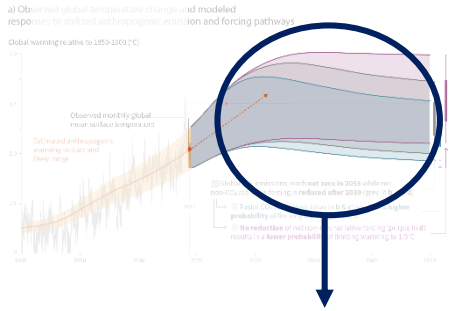
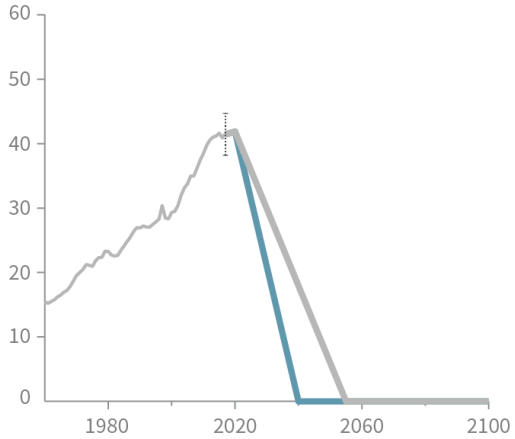


Faster immediate CO_2 emission reductions limit cumulative CO_2 emissions

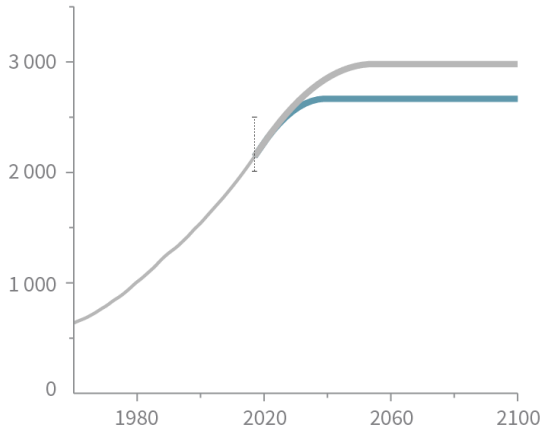
Stylized net global CO_2 emission pathways

Billion tonnes CO_2 per year ($GtCO_2$/yr)



Cumulative net CO_2 emissions

Billion tonnes CO_2 ($GtCO_2$)



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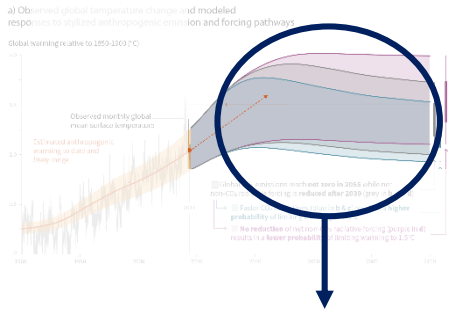
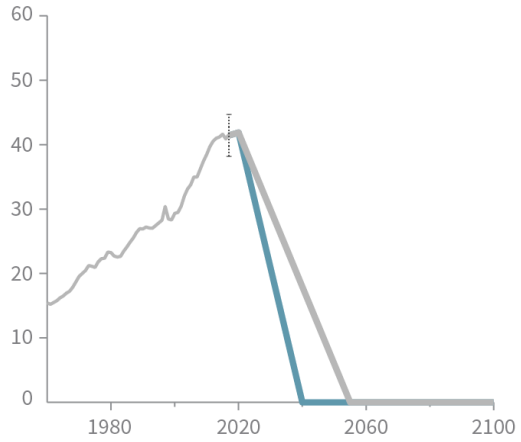
Cumulative emissions of CO_2 and future net effect of other emissions determine future global warming and climate-related risks

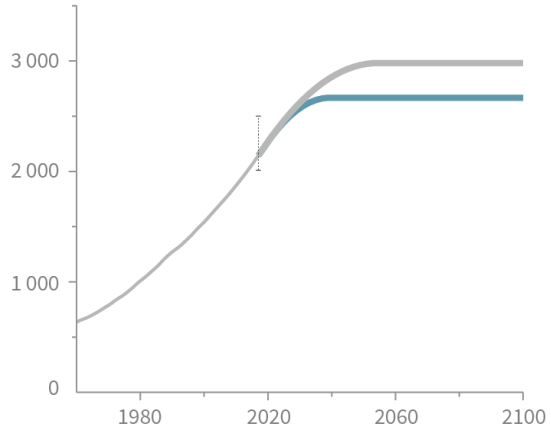


Future maximum temperature rise is determined by cumulative CO_2 emissions and the net effect of methane, nitrous oxide, aerosols and other anthropogenic forcing agents.

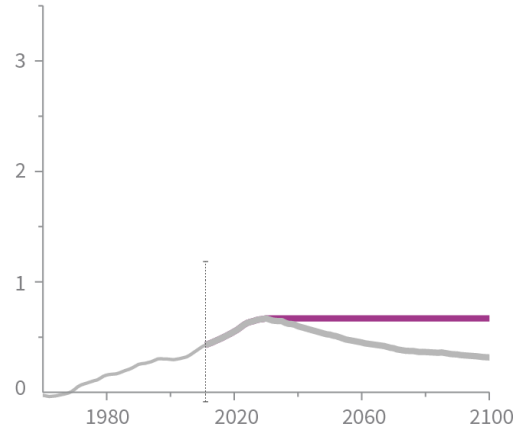
Stylized net global CO_2 emission pathways
Billion tonnes CO_2 per year ($GtCO_2$/yr)



Cumulative net CO_2 emissions
Billion tonnes CO_2 ($GtCO_2$)



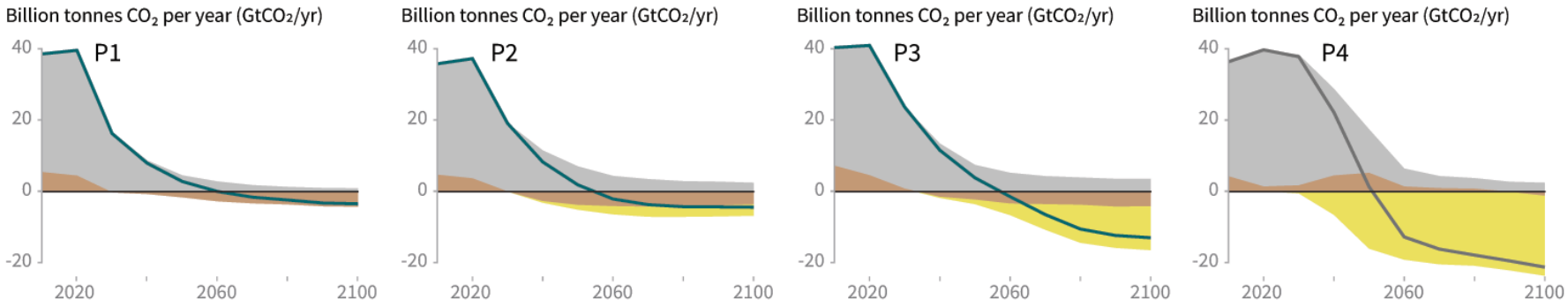
Non-CO_2 radiative forcing pathways
Watts per square metre (W/m^2)



Interactive version of this figure : https://apps.ipcc.ch/report/sr15/fig1/index.html

Different mitigation strategies can achieve emission reductions compatible with pathways limiting global warming to 1.5°C

Breakdown of contributions to global net CO_2 emissions in four illustrative model pathways



Innovations, lower energy demand, rapid decarbonization of energy supply

Sustainability

Societal and technological development following historical patterns

Resource and energy-intensive development, high demand for transportation fuels and livestock products

- Fossil fuel and industry
- Agriculture, forestry and other land use
- Bioenergy with carbon capture and storage

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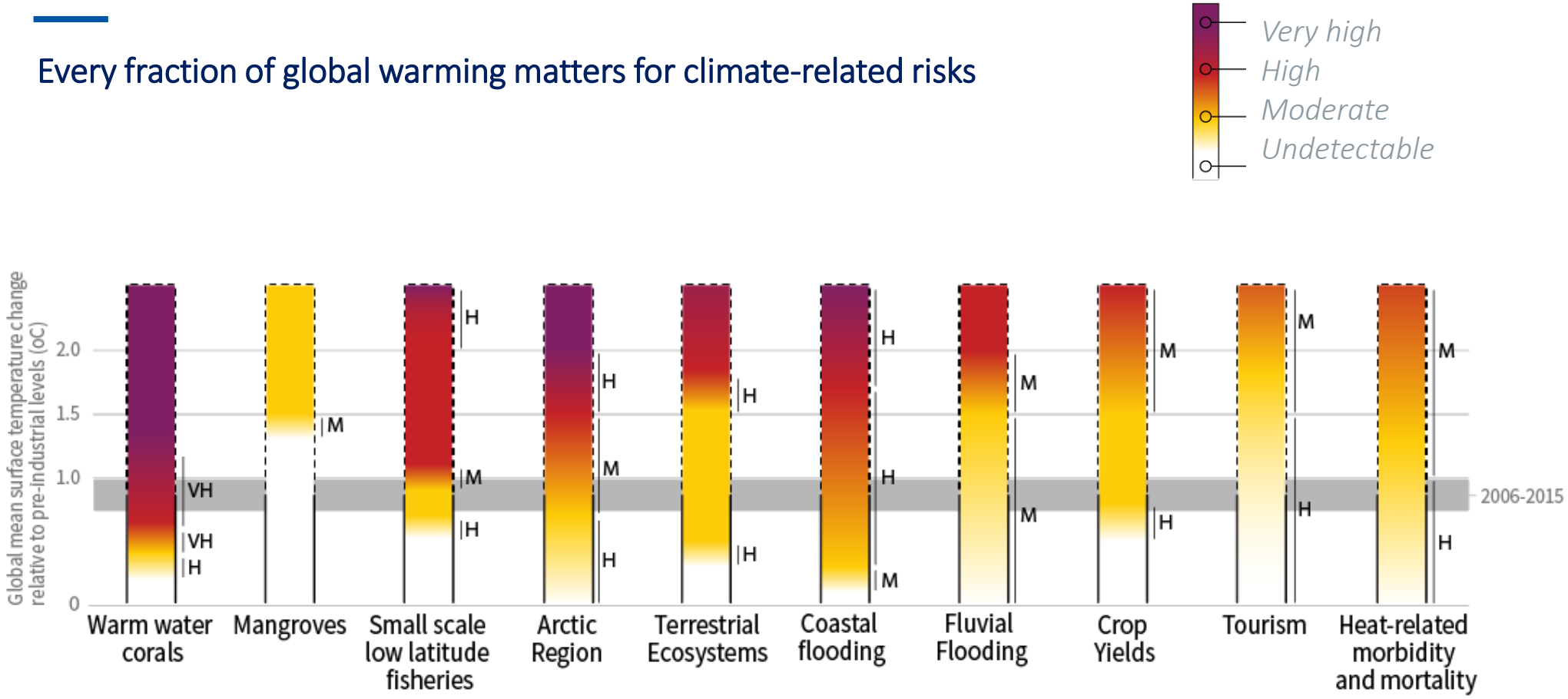
Every fraction of global warming matters for climate-related risks



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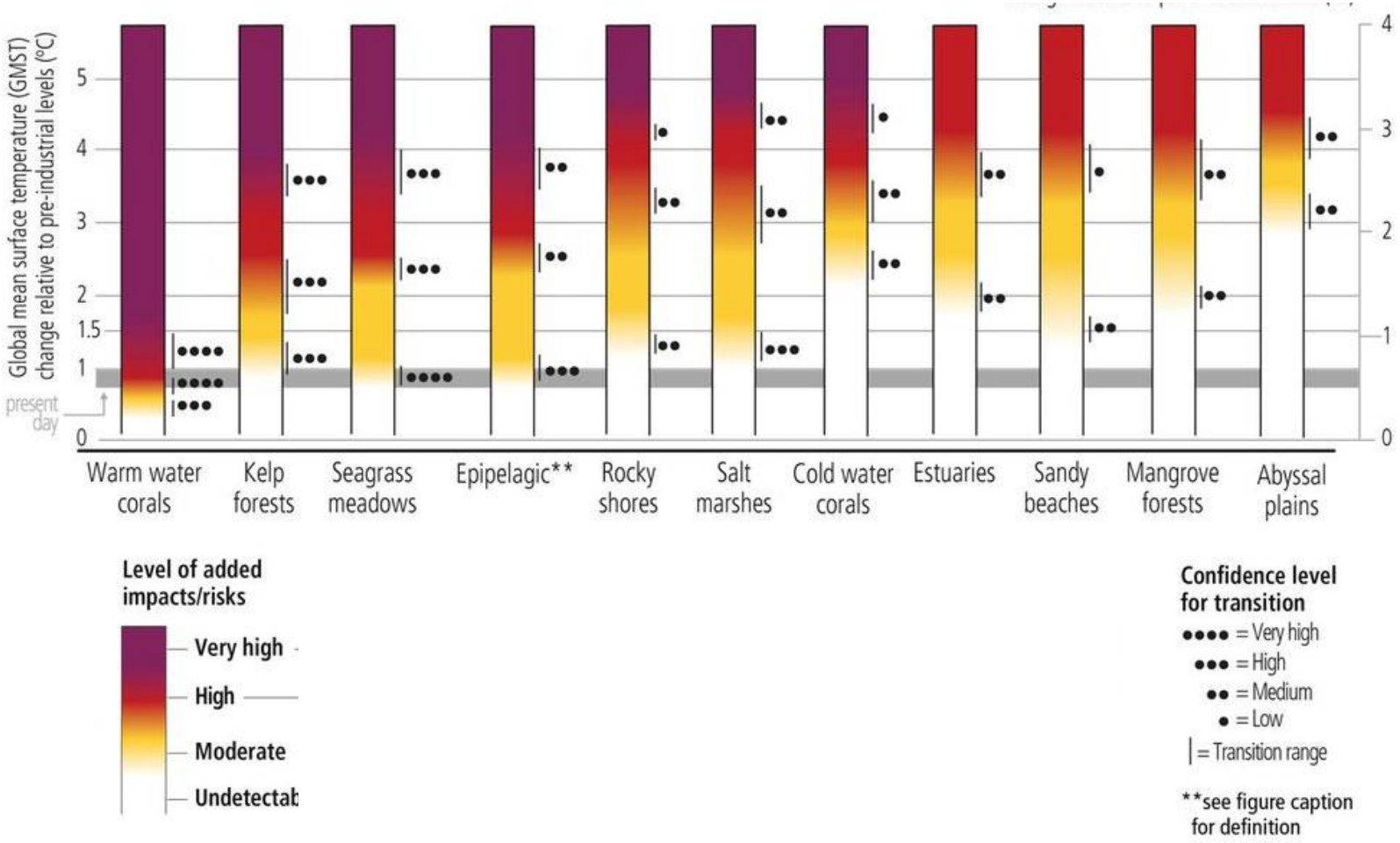
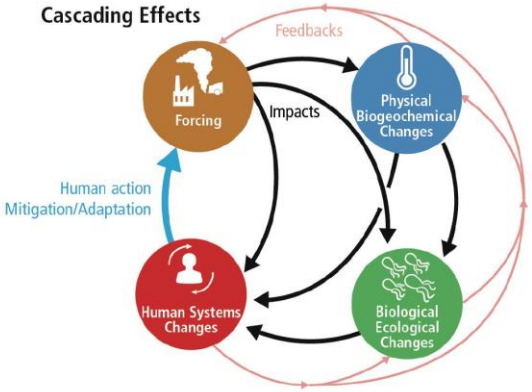
Ocean warming, acidification and loss of oxygen increasingly affects marine life





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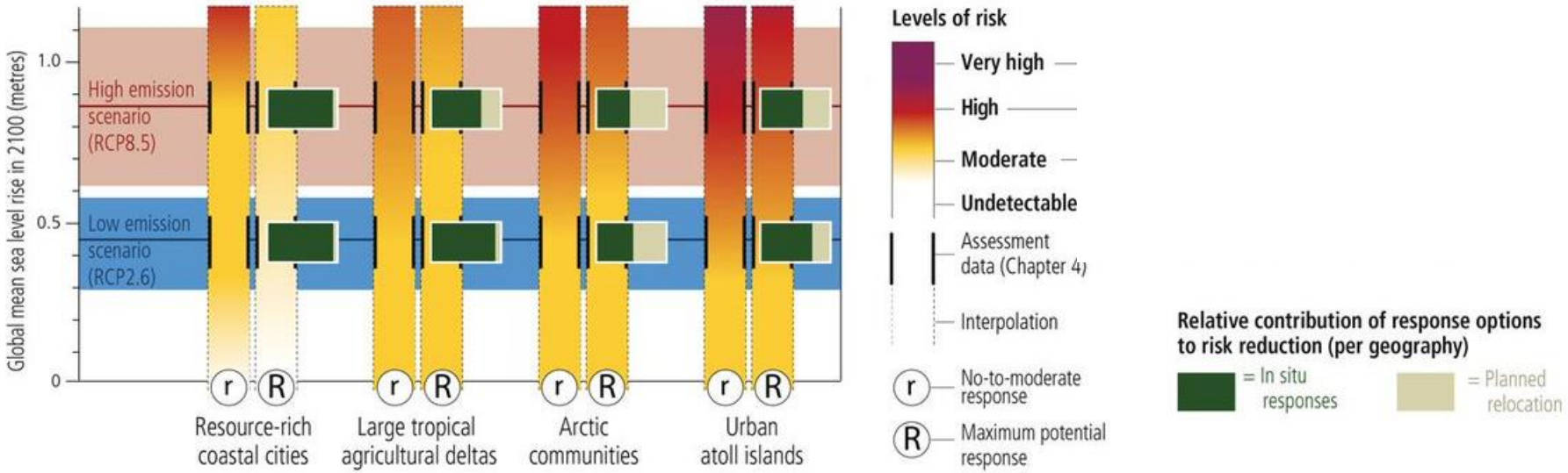
Reducing greenhouse gas emissions, in situ adaptation measures and/or planned relocation can reduce and delay risks driven by sea level rise and extreme sea level events



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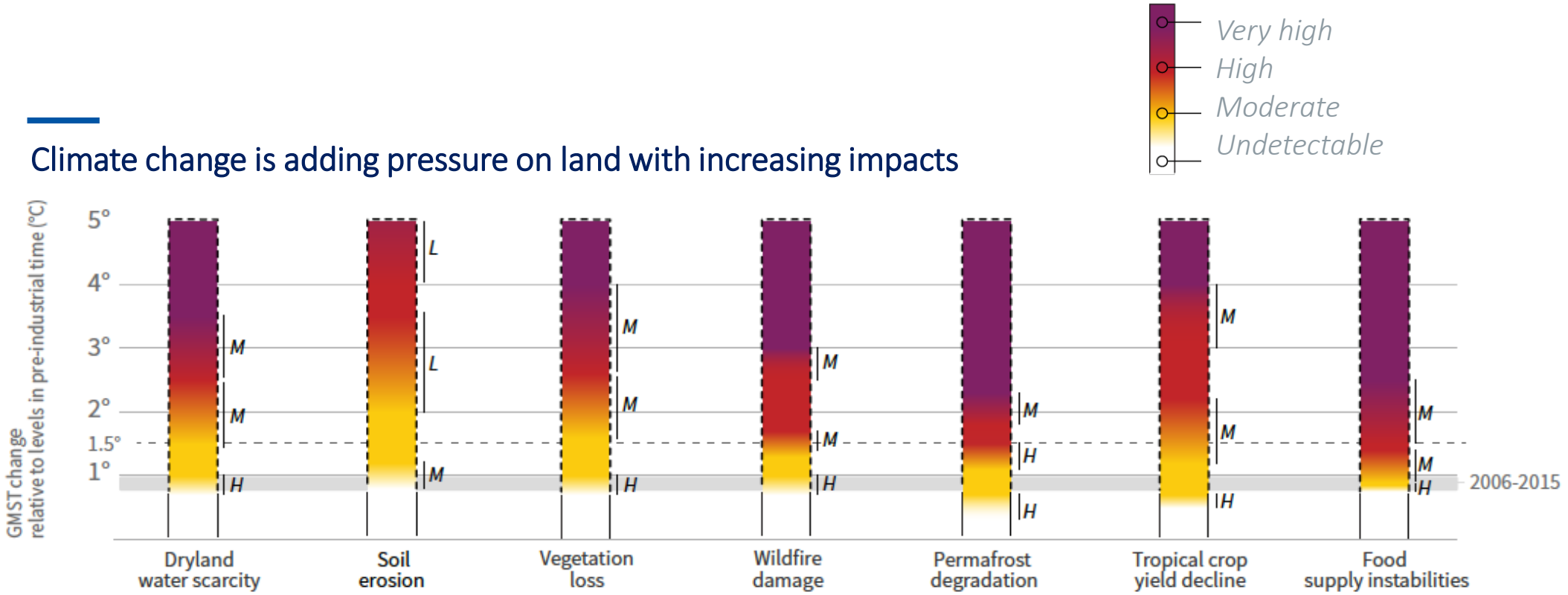
Climate change is adding pressure on land with increasing impacts



- Risks from desertification, land degradation, food insecurity are higher for development choices that are linked to increases in population, in resource intensive production and consumption, inequality, low adaptation capacity and with increased pressure on land
- Sustainable land management can help reduce adverse impacts
- While land can make a valuable contribution to climate change mitigation, there are limits to the deployment of land-based mitigation measures such as bioenergy crops or afforestation.

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Working Group I

Large-scale climate change

Chapter 1: Framing, context, methods
Chapter 2: Changing state of the climate system
Chapter 3: Human influence on the climate system
Chapter 4: Future global climate: scenario-based projections and near-term information
Chapter 5: Global carbon and other biogeochemical cycles and feedbacks
Chapter 6: Short-lived climate forcers
Chapter 7: The Earth's energy budget, climate feedbacks, and climate sensitivity
Chapter 8: Water cycle changes
Chapter 9: Ocean, cryosphere, and sea level change
Chapter 10: Linking global to regional climate change
Chapter 11: Weather and climate extreme events in a changing climate
Chapter 12: Climate change information for regional impact and for risk assessment
Atlas of Regional Climate Information

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Climate processes

Working Group I

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Regional climate information

Working Group I

Expert and Government Review of the Second Order Draft
> 50 000 comments

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Cut-off dates
Scientific papers accepted for publication before **31 Jan 2021**

Thank You

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