

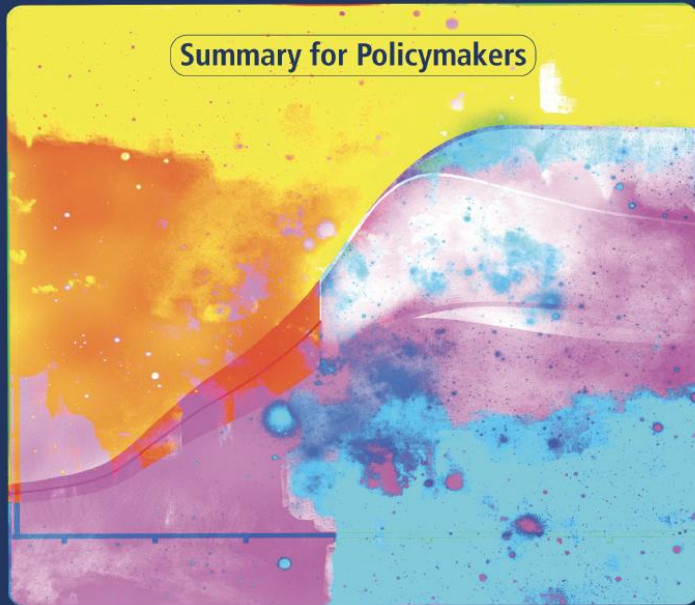
SR1.5, October 2018

ipcc

INTERGOVERNMENTAL PANEL ON climate change

Global Warming of 1.5°C

An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty



WG I WG II WG III



SRCLL, August 2019

ipcc

INTERGOVERNMENTAL PANEL ON climate change

Climate Change and Land

An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems

Summary for Policymakers



WG I WG II WG III



SROCC, September 2019

ipcc

INTERGOVERNMENTAL PANEL ON climate change

The Ocean and Cryosphere in a Changing Climate

Special Report of the Intergovernmental Panel on Climate Change

Summary for Policymakers



WG I WG II



WGII: Avoiding Impact (Severity) guiding AMBITION in Mitigation and Adaptation

Hans-O. Pörtner, Co-Chair IPCC WGII AR6

IPCC 6th Assessment Cycle: 3 Special Reports released between October 2018 and September 2019

ipcc
INTERGOVERNMENTAL PANEL ON climate change





Ashley Cooper / Aurora Photos

Where are we?

Since pre-industrial times, human activities have caused approximately **1.0°C of global warming**.

- Already seeing **consequences for people, nature and livelihoods**
- At current rate, would **reach 1.5°C between 2030 and 2052**
- **Past emissions alone do not commit the world to 1.5°C**



Drylands currently cover about **46.2% of global land** and are **home to 3 billion people.**

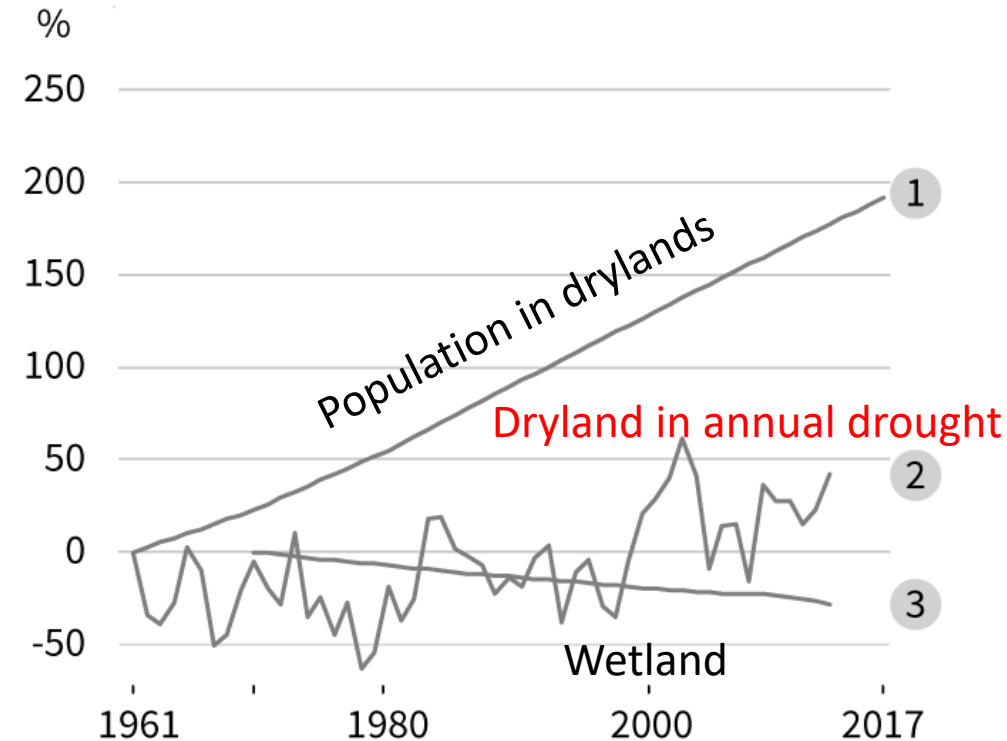
Current background: unsustainable uses of land

F. Desertification and land degradation

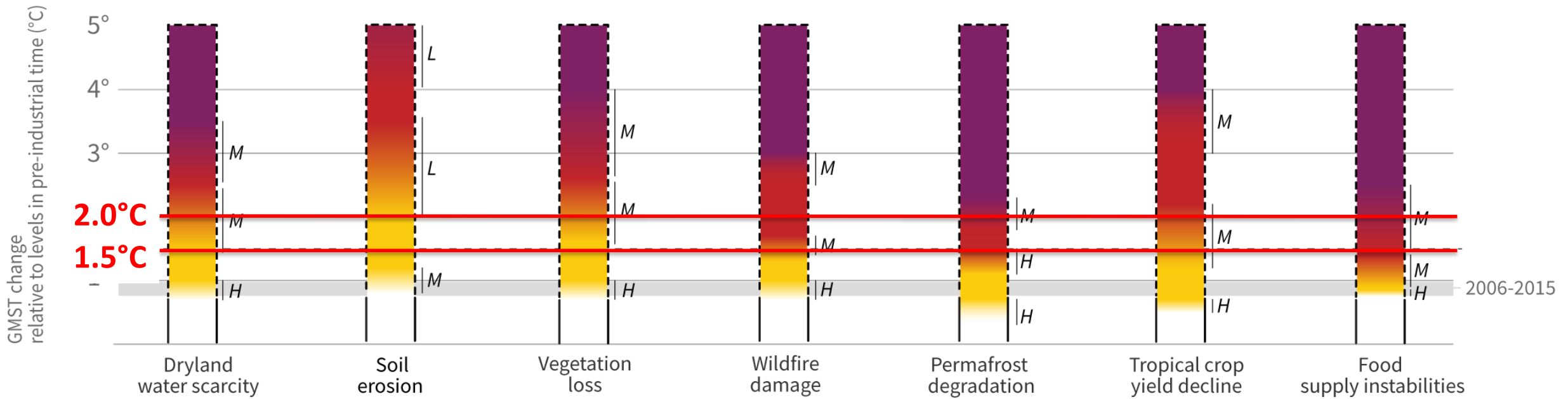
Land-use change, land-use intensification and climate change have contributed to desertification and land degradation.

CHANGE in % rel. to 1961 and 1970

- 1 Population in areas experiencing desertification
- 2 Dryland areas in drought annually
- 3 Inland wetland extent

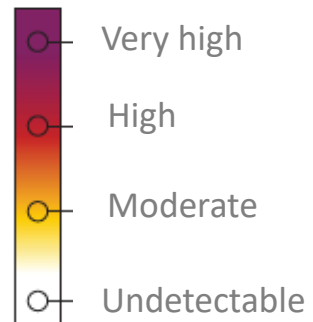


Risks to humans and ecosystems from changes in land-based processes as a result from climate change



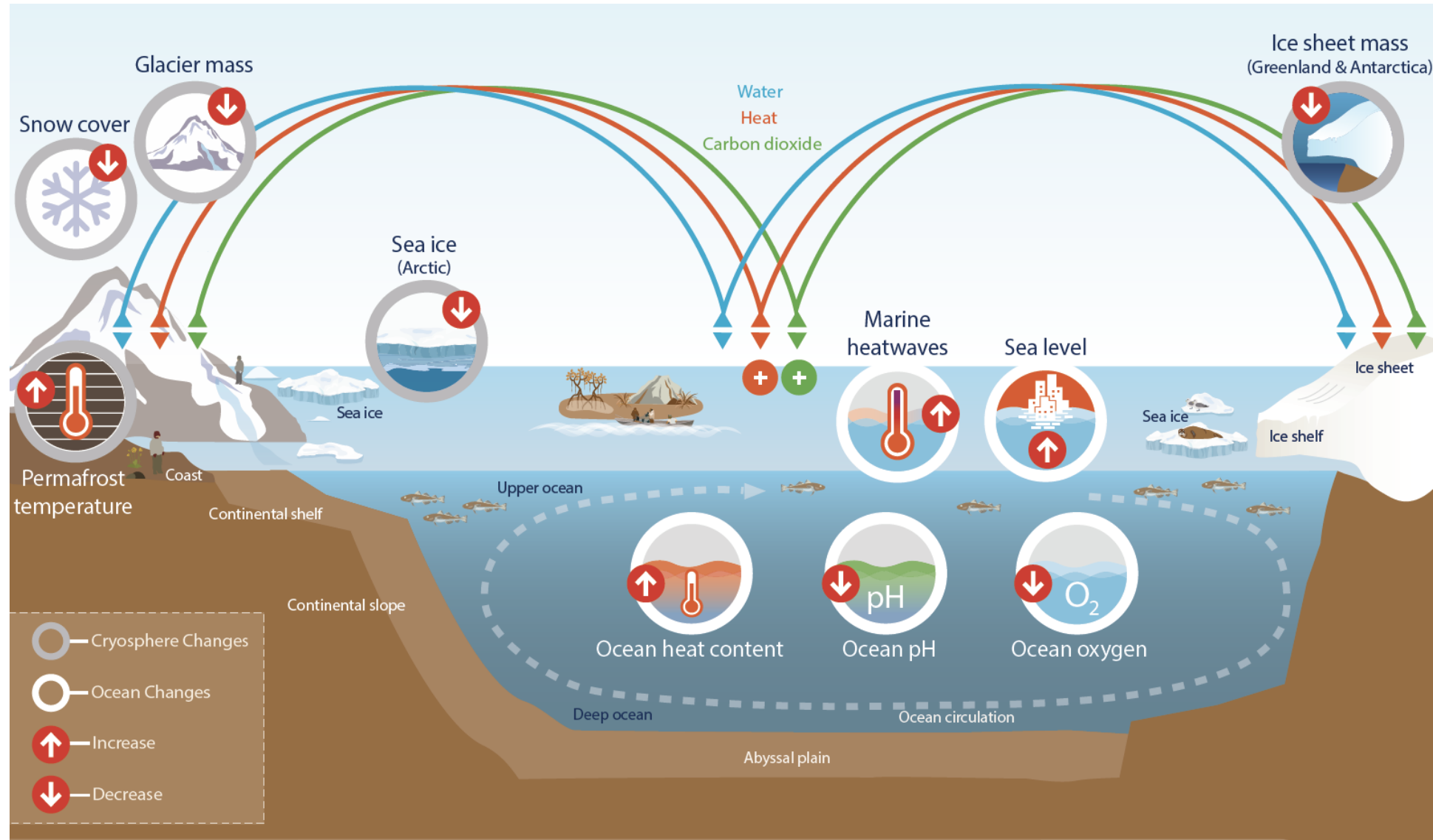
Human food security is at stake

Level of additional impact/risk due to climate change



SROCC in a nutshell

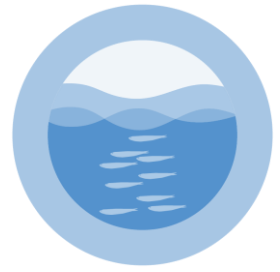
...on 80 % of the earth surface climate change affects the life sustaining systems - from the top of the mountains to the depth of oceans. These changes will continue for generations to come.



TS.2

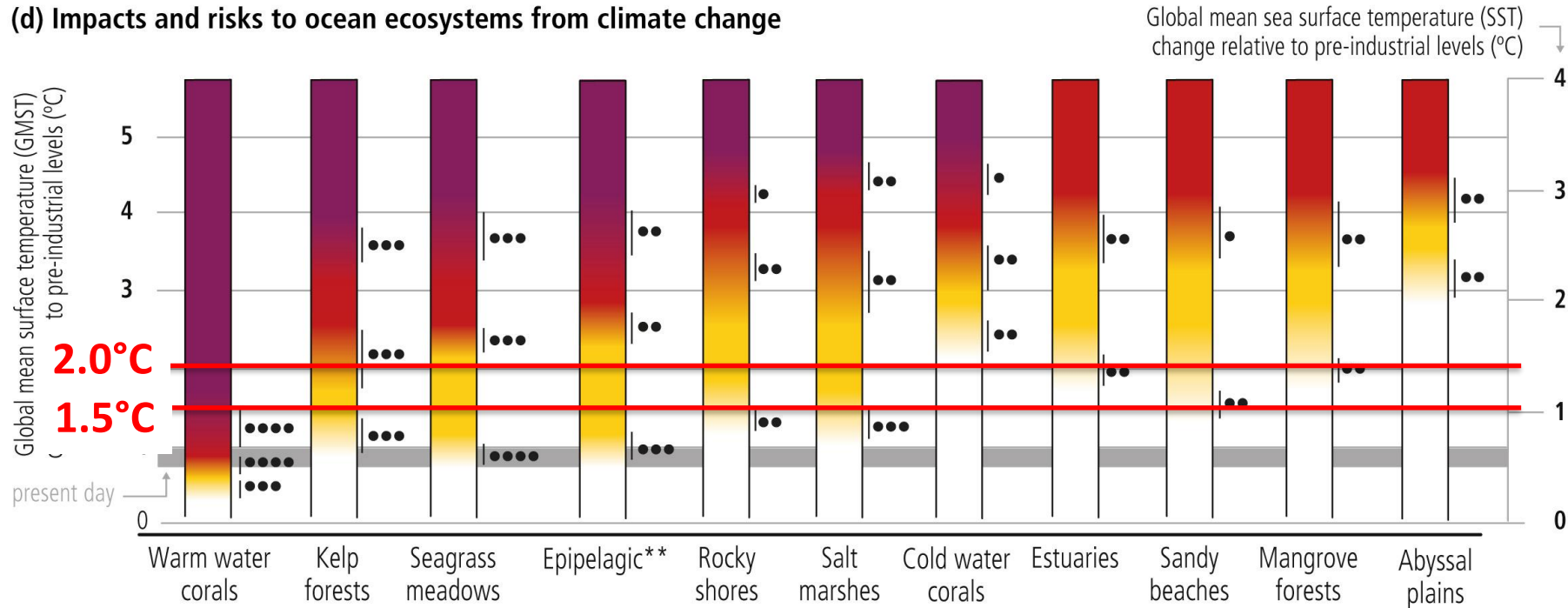
Current background: unsustainable ocean uses

Ocean and coastal ecosystems: future risks



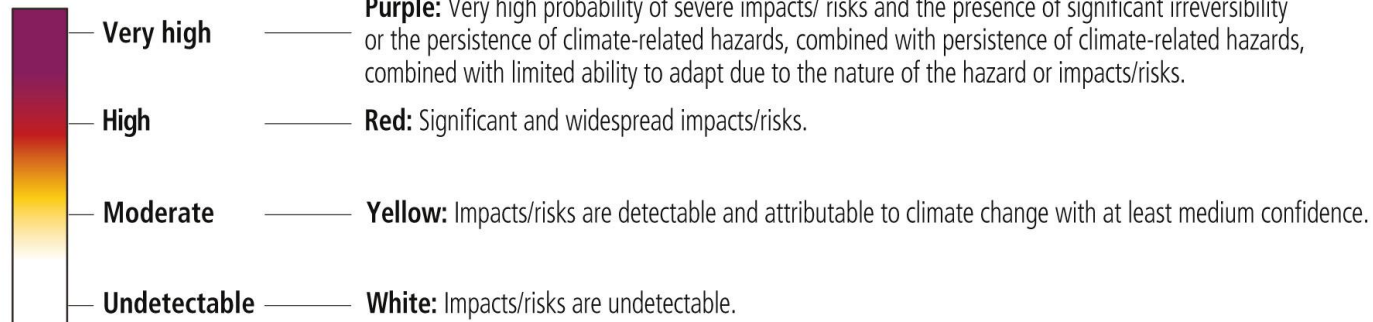
SROCC

(d) Impacts and risks to ocean ecosystems from climate change

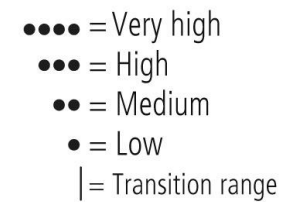


Ecosystems would benefit from ambitious mitigation

Level of added impacts/risks



Confidence level for transition



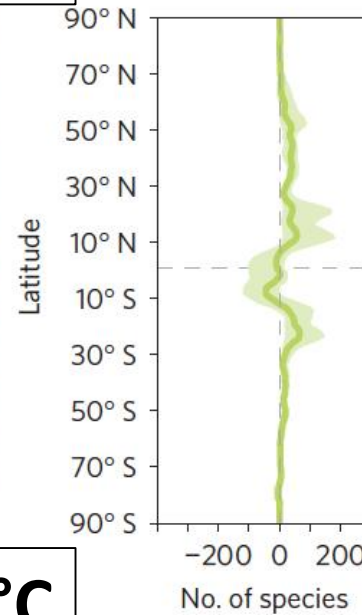
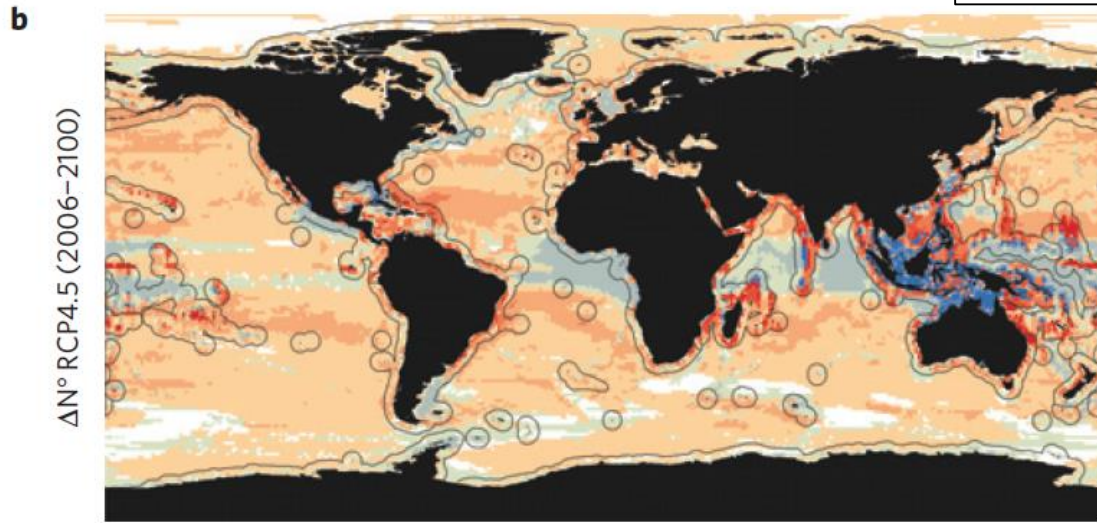
**see figure caption for definition

Marine biodiversity projections

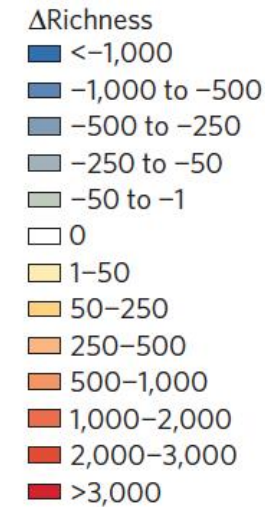
Drivers of change:
Warming and velocity...

Garcia-Molinos
et al. 2015,
2017 NCC

+2.4°C

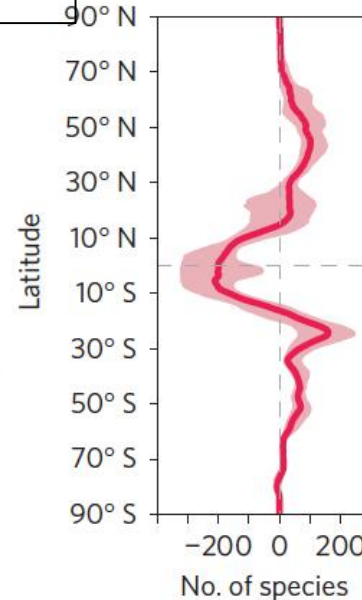
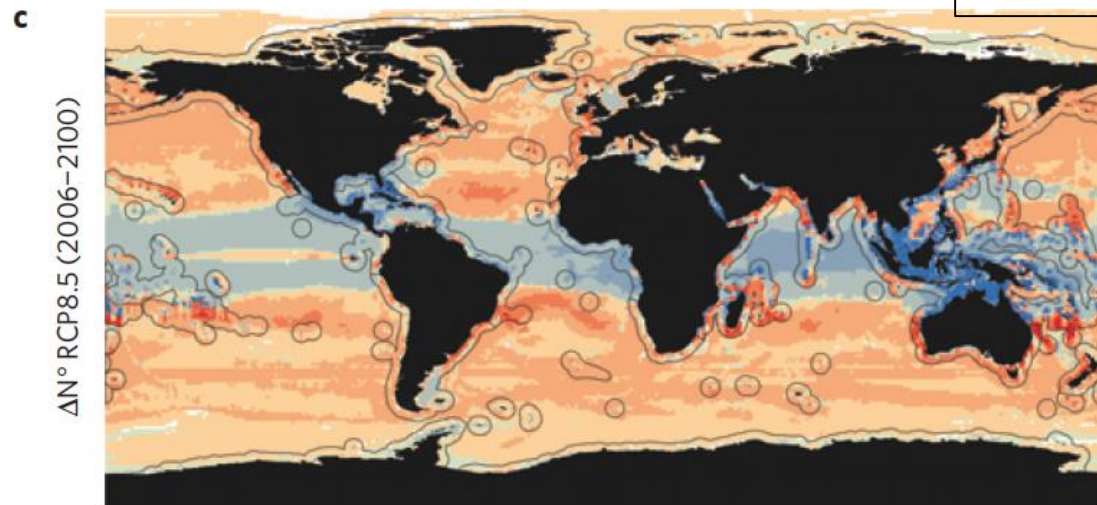


RCP 4.5



RCP4.5 versus 8.5
Ultimate Species Heat Limits surpassed in Tropics

+4.3°C



RCP 8.5

Projections: Large changes in community composition expected driven by local invasions and losses

Projections: Large changes in community composition expected driven by local invasions and losses

Projected changes, impacts and risks for fisheries as a result of climate change

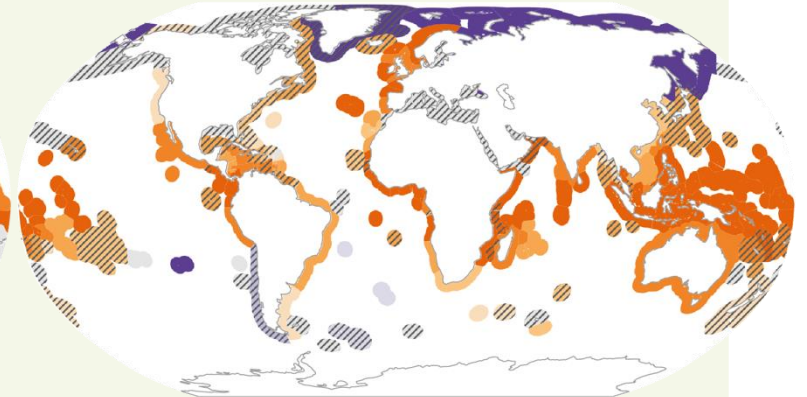
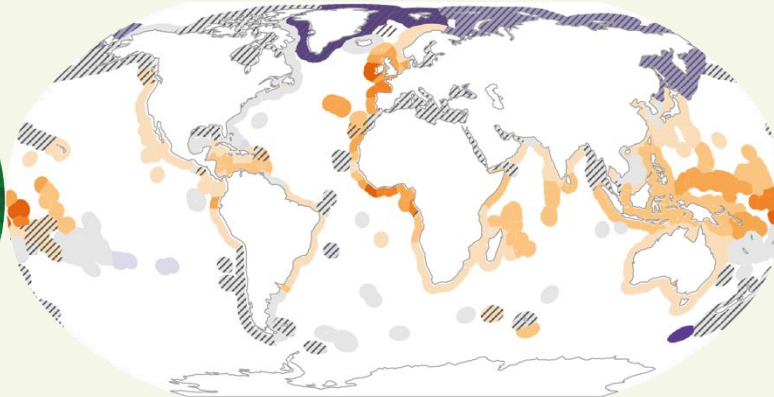
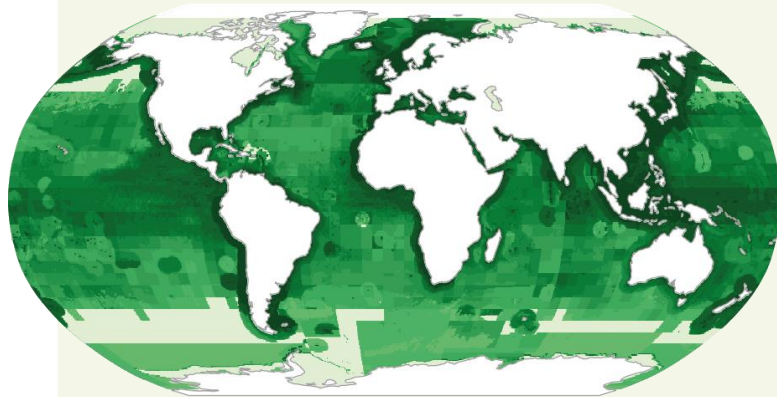
(c) Maximum fisheries catch potential

~+1.5°C

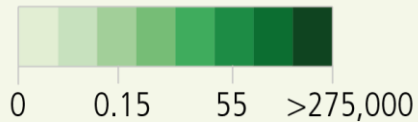
~+4°C

RCP2.6

RCP8.5



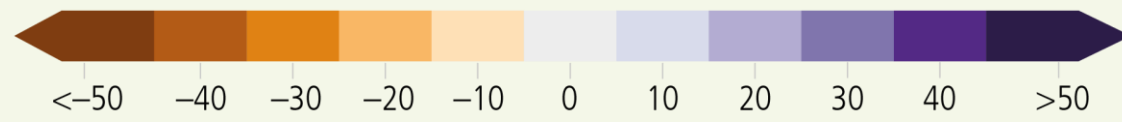
Observed values in tonnes* (1986–2005)



* See figure caption for details

Percent change

Average by 2081–2100, relative to 1986–2005



model disagreement

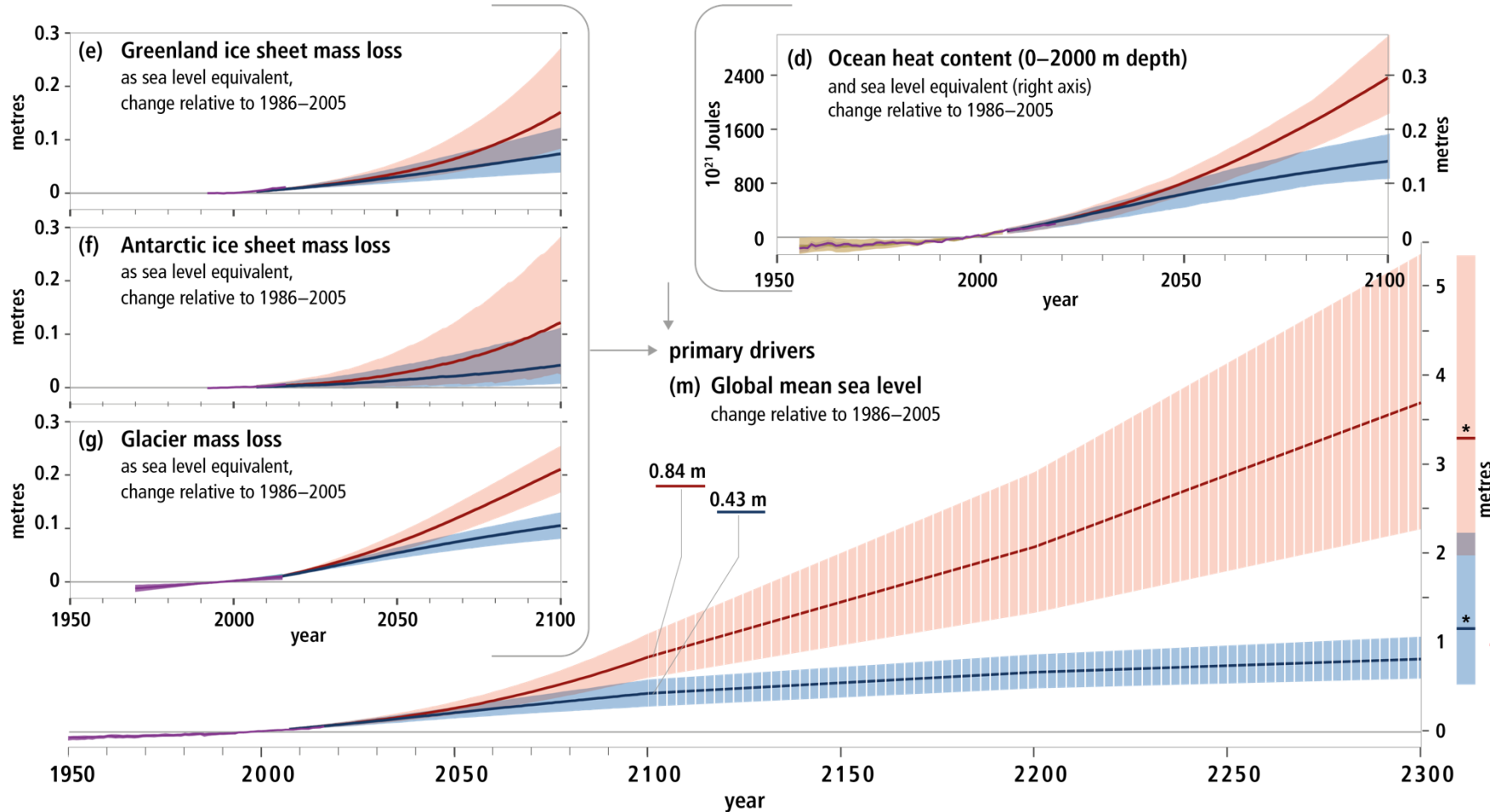


no data

Past and future changes in the ocean and cryosphere

Historical changes (observed and modelled) and projections under RCP2.6 and RCP8.5 for key indicators

— Historical (observed)
 — Historical (modelled)
 — Projected (RCP2.6)
 — Projected (RCP8.5)



Sea level: **SROCC**

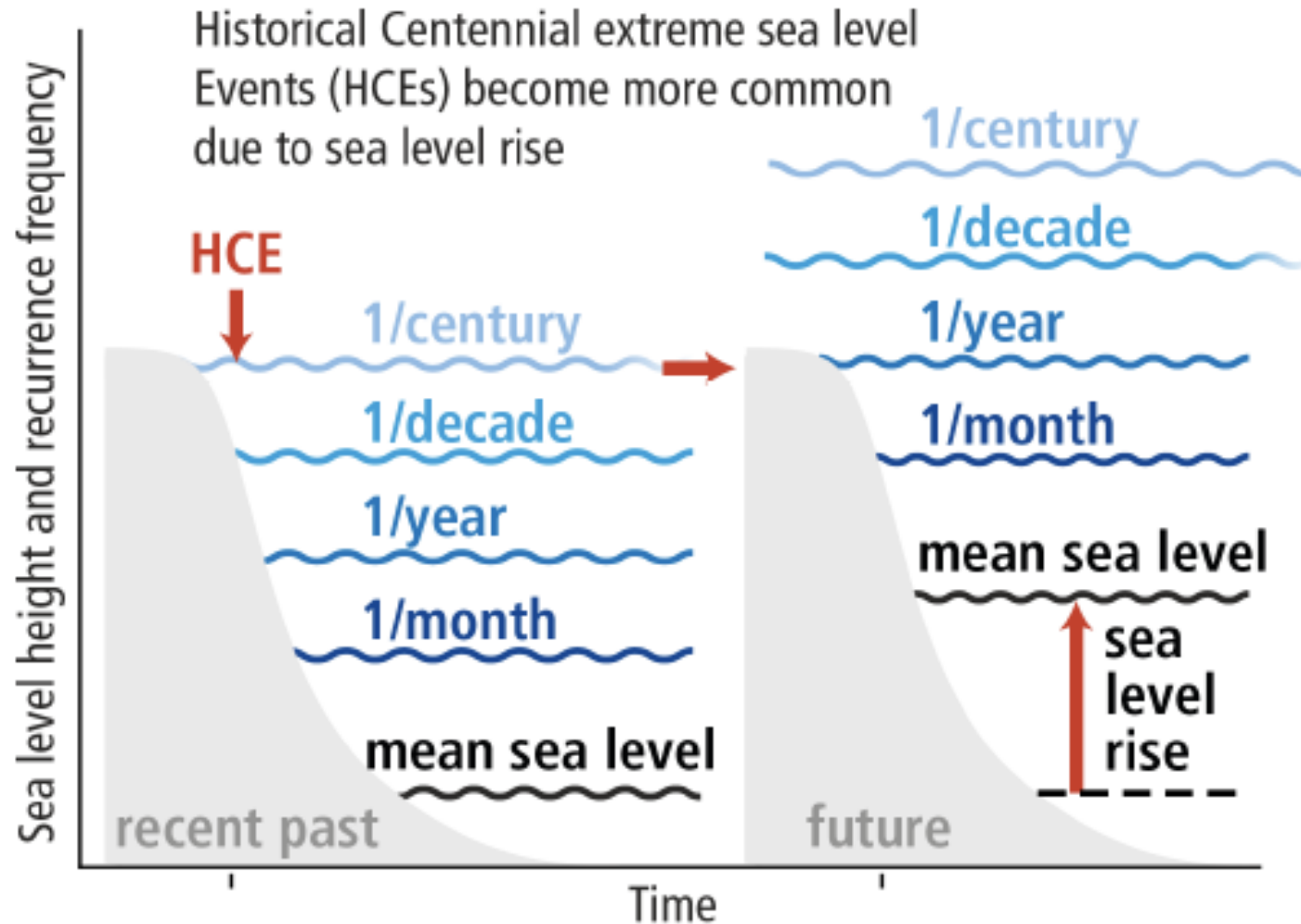
according to present knowledge... we have choices between below 1 metre or up to several metres by 2300 due to

- Thermal expansion
- Glacier melt
- Ice sheet melt

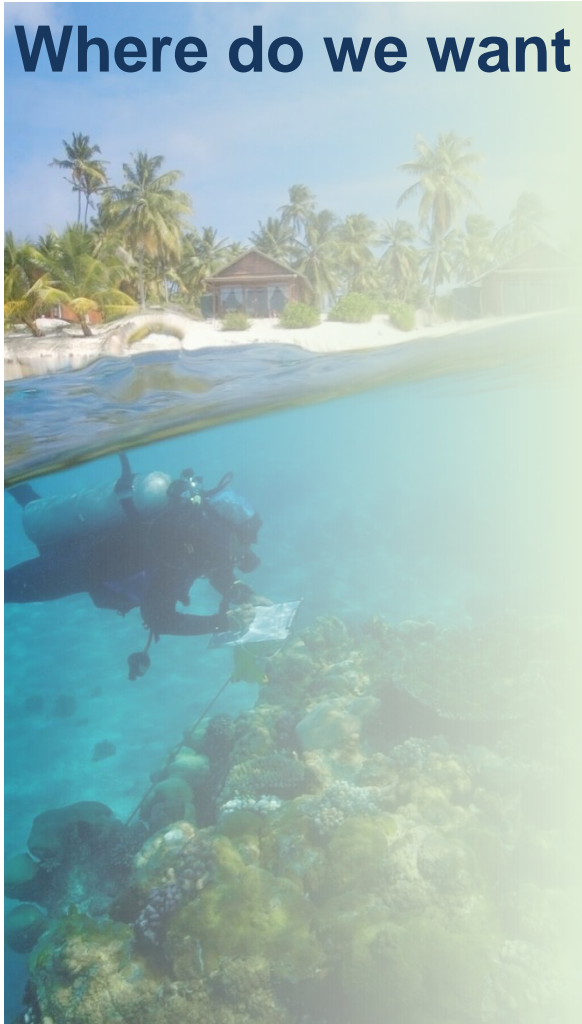
~1.5°C

Extreme events on top of sea level rise

(a) Schematic effect of regional sea level rise on projected extreme sea level events (not to scale)



Where do we want to go? Considering land and ocean impacts

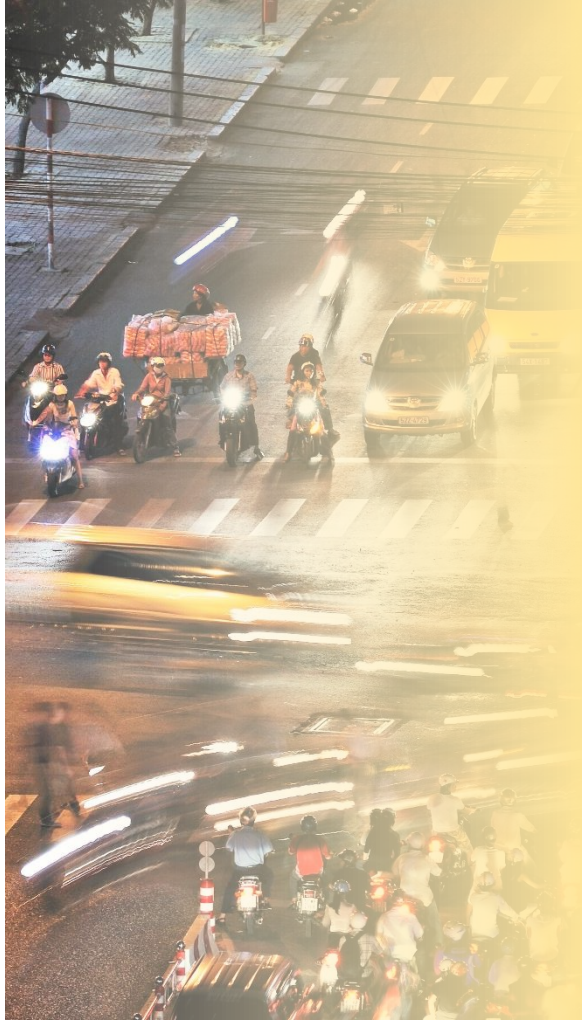


Andre Seale / Aurora Photos

At 1.5°C compared to 2°C:

- **Smaller reductions in yields** of maize, rice, wheat and sorghum, **smaller reductions in fisheries yields**
- Global human population exposed to water stress is up to **50% less**, also less water stress for ecosystems
- Up to **several hundred million fewer people exposed to climate-related risk and susceptible to poverty by 2050**
- **Lower impact on biodiversity and species**

Avoided impact (severity) for land and oceans: guiding ambition in adaptation and mitigation



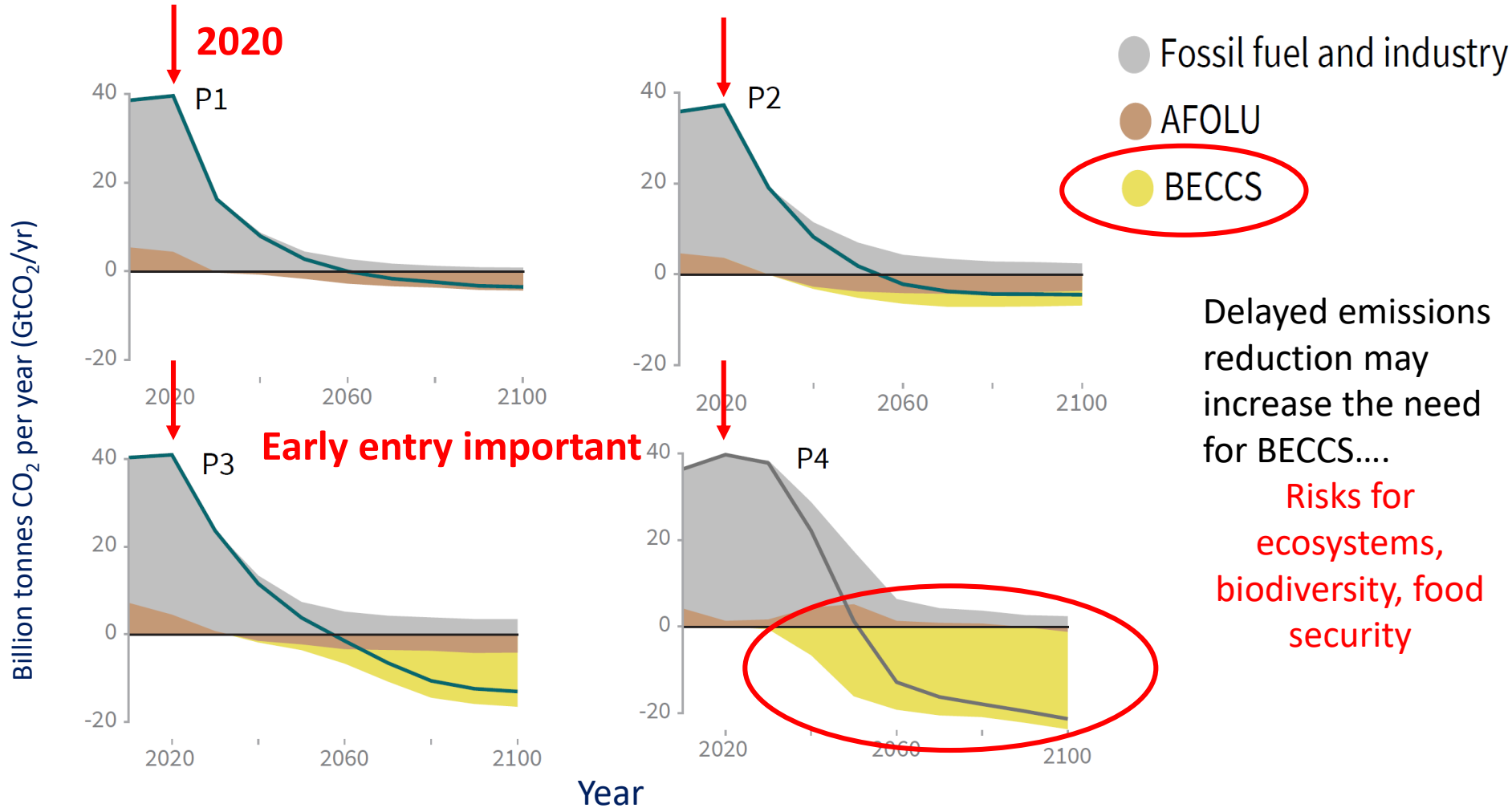
Gerhard Zwirger-Schoner / Aurora Photos

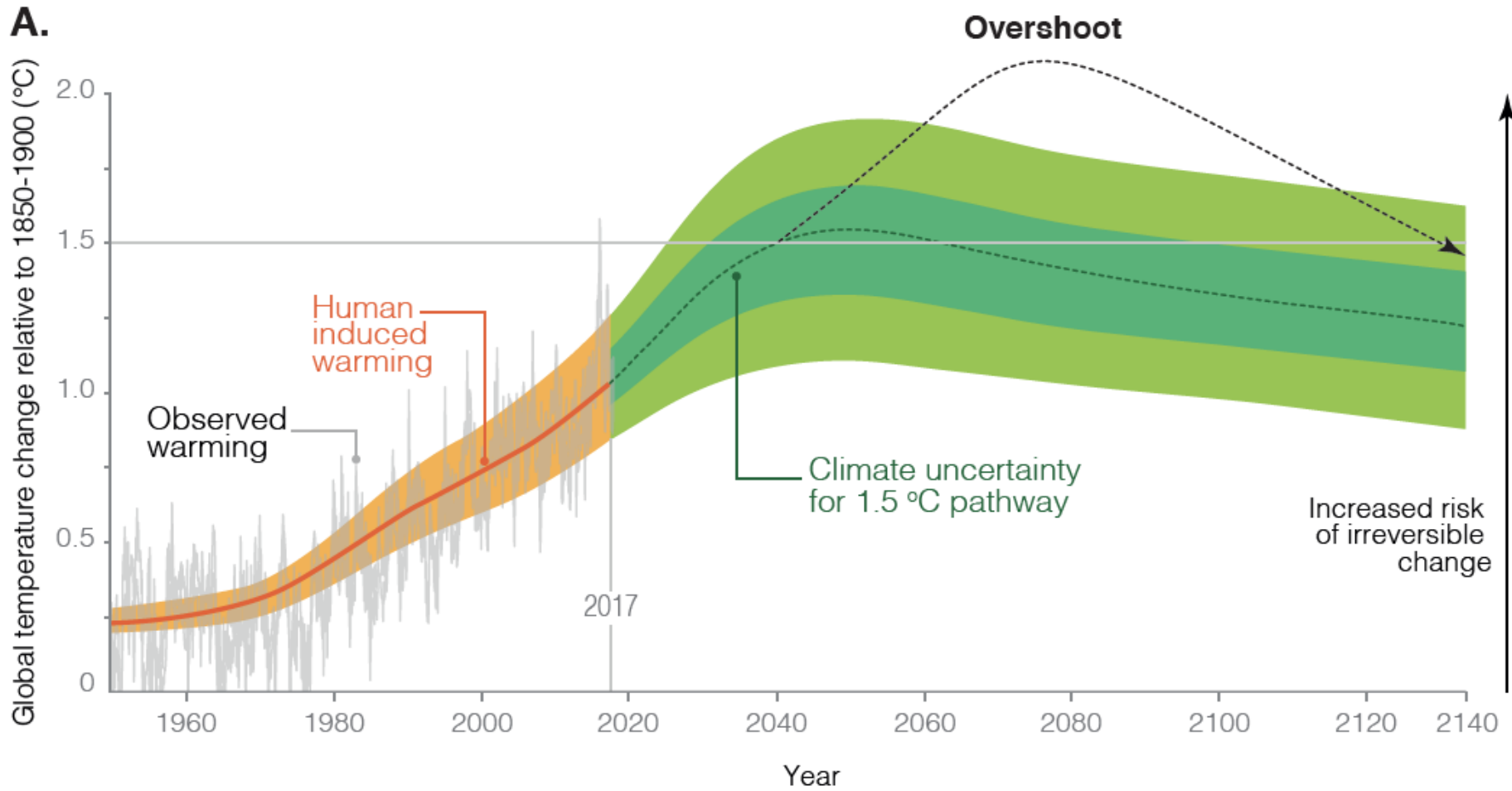
How do we get there?

- To limit warming to 1.5°C, CO₂ emissions fall by about **45% by 2030** (from 2010 levels)
 - ↳ *Compared to 20% for 2°C*
- To limit warming to 1.5°C, CO₂ emissions would need to reach '**net zero**' around **2050**
 - ↳ *Compared to around 2075 for 2°C*
- **Reducing non-CO₂ emissions** would contribute and also have direct and immediate health benefits

For keeping warming to 1.5°C ADAPTATION and MITIGATION measures can bring their own risks:

Different pathways and mitigation strategies have variable needs for negative emission technologies, e.g. BECCS, i.e. Bioenergy and Carbon Capture and Storage





Pathways of global warming with the goal to reach and maintain 1.5°C



SR1.5, SRCCL, SROCC

Ambitious mitigation
combined with land
and ocean
management for
sustainability support
**biodiversity
conservation
and food security for
human society**

15

ipcc

INTERGOVERNMENTAL PANEL ON climate change



 **SUSTAINABLE DEVELOPMENT GOALS**



**1.5°C facilitates reaching SDGs:
Multiple synergies between mitigation
and adaptation technologies**

The Paris agreement and climate impacts provide a sense of urgency: Overcoming societal inertia, political paralysis and inaction in transformation ... reaching sustainability for ecosystems and people



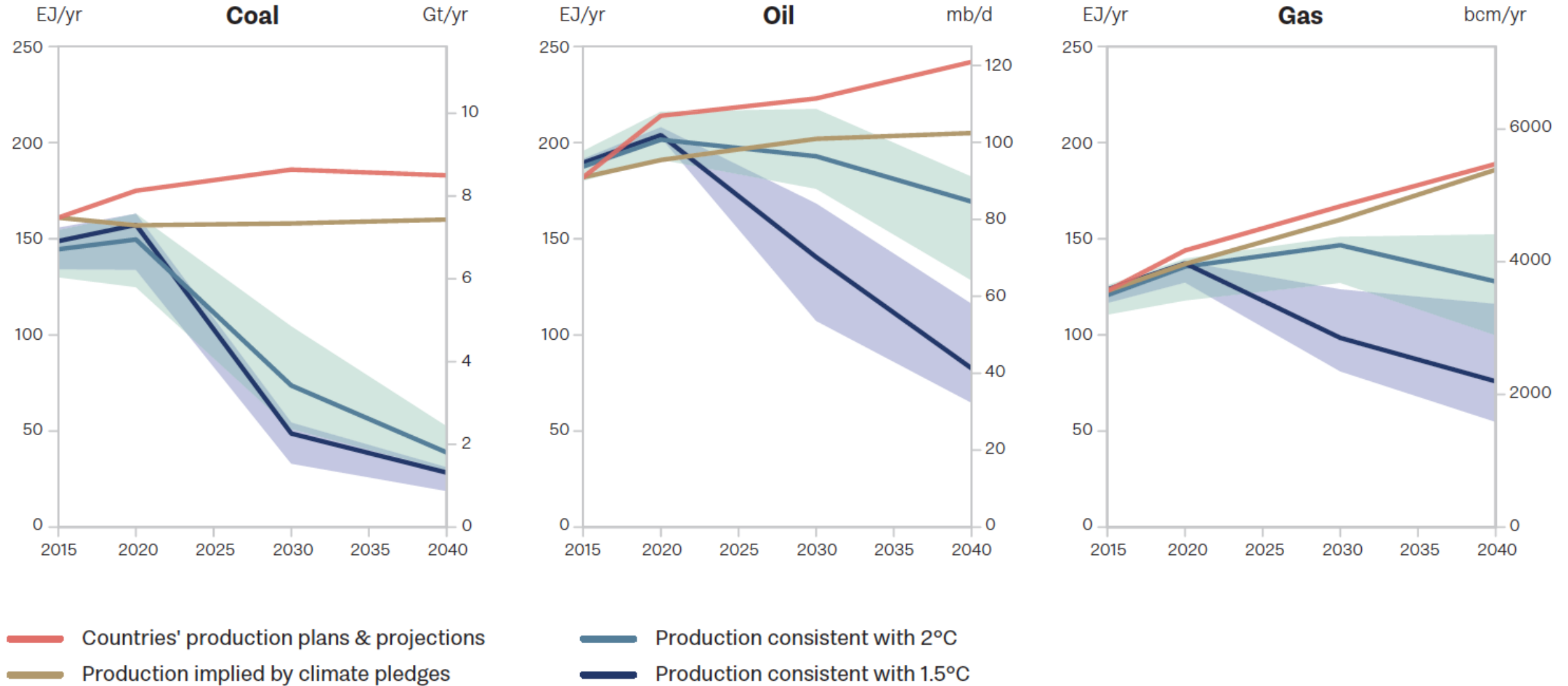
A common response even among those who (should) know...!?

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)
- Institutions --- **yes**
- Informed policy and governance leading and directing societal transformation ---- **may be**?

BOTTLE NECK

Production gap: Extraction plans for fossil fuels do not meet climate targets



21.11.2019

UNEP Production Gap Report 2019

SR1.5, SRCCL, SROCC:

For minimizing impact (severity) and associated risks....

Every bit of warming matters

Each year matters

Each choice matters.... closely following 1.5°C emission trajectories matters

Political and societal will matters

Let us unite behind the science (Haakon, Crown Prince of Norway, OurOceans Oslo 2019)

Ashley Cooper/ Aurora Photos

ipcc
INTERGOVERNMENTAL PANEL ON climate change



More Information:

Website: <http://ipcc.ch>

microsites: SR1.5, SRCCL, SROCC


IPCC Secretariat: ipcc-sec@wmo.int

IPCC Press Office: ipcc-media@wmo.int

Find us on:

 @IPCC_CH

 @IPCCNews

 @IPCC_Climate_Change

 www.vimeo.com/ipcc

 www.youtube.com/c/ipccgeneva

