IPCC presentations for the Structured Expert Dialogue

Presentation 3: Information and knowledge gaps addressed in the IPCC 2018-19 Special Reports with regard to scenarios to achieve the LTGG and the range of associated impacts

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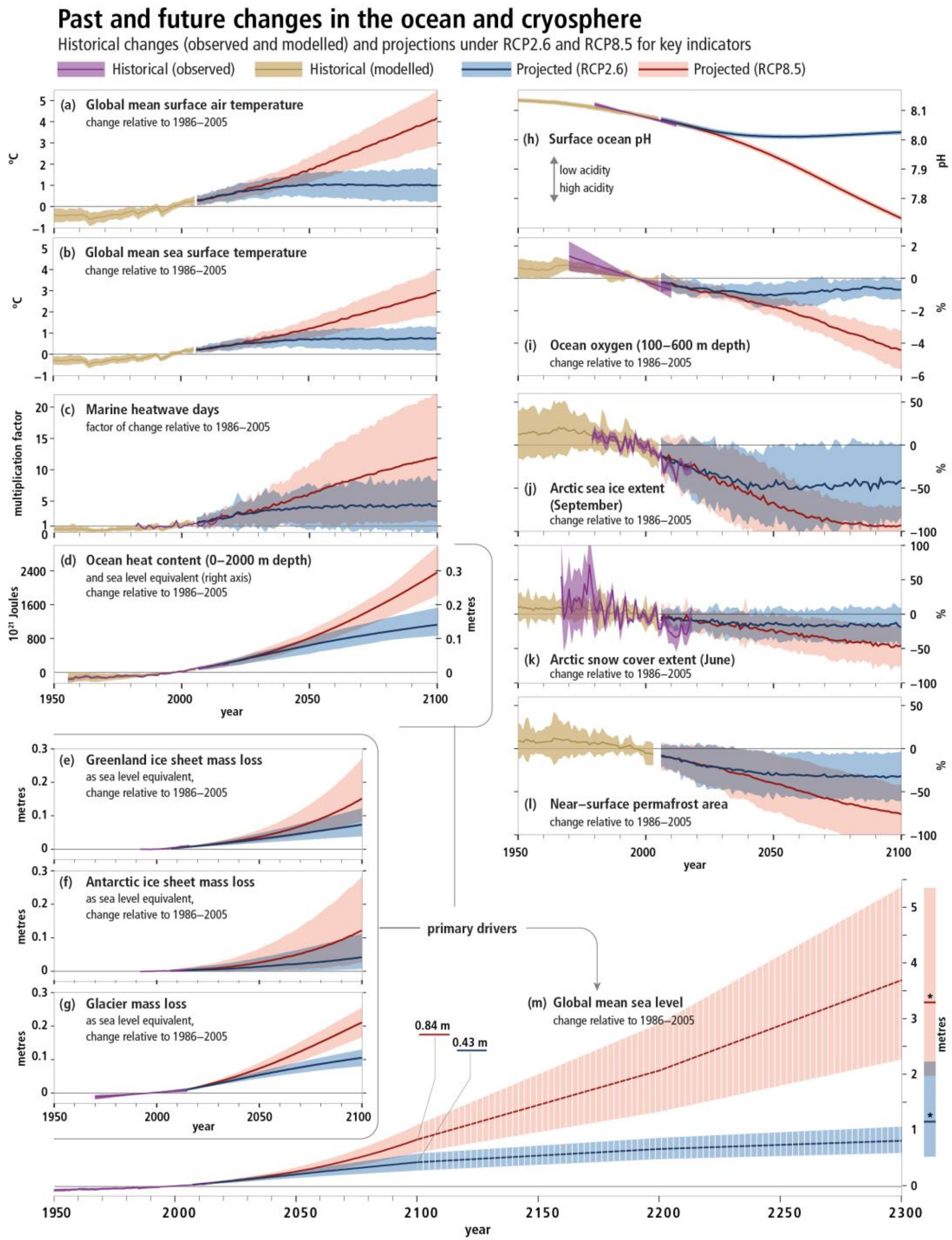
ipcc INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP



Impacts:

Past & future changes in the ocean & cryosphere

Red = High Emissions (RCP8.5)

Blue = Low Emissions (RCP2.6)

SROCC Figure SPM.1

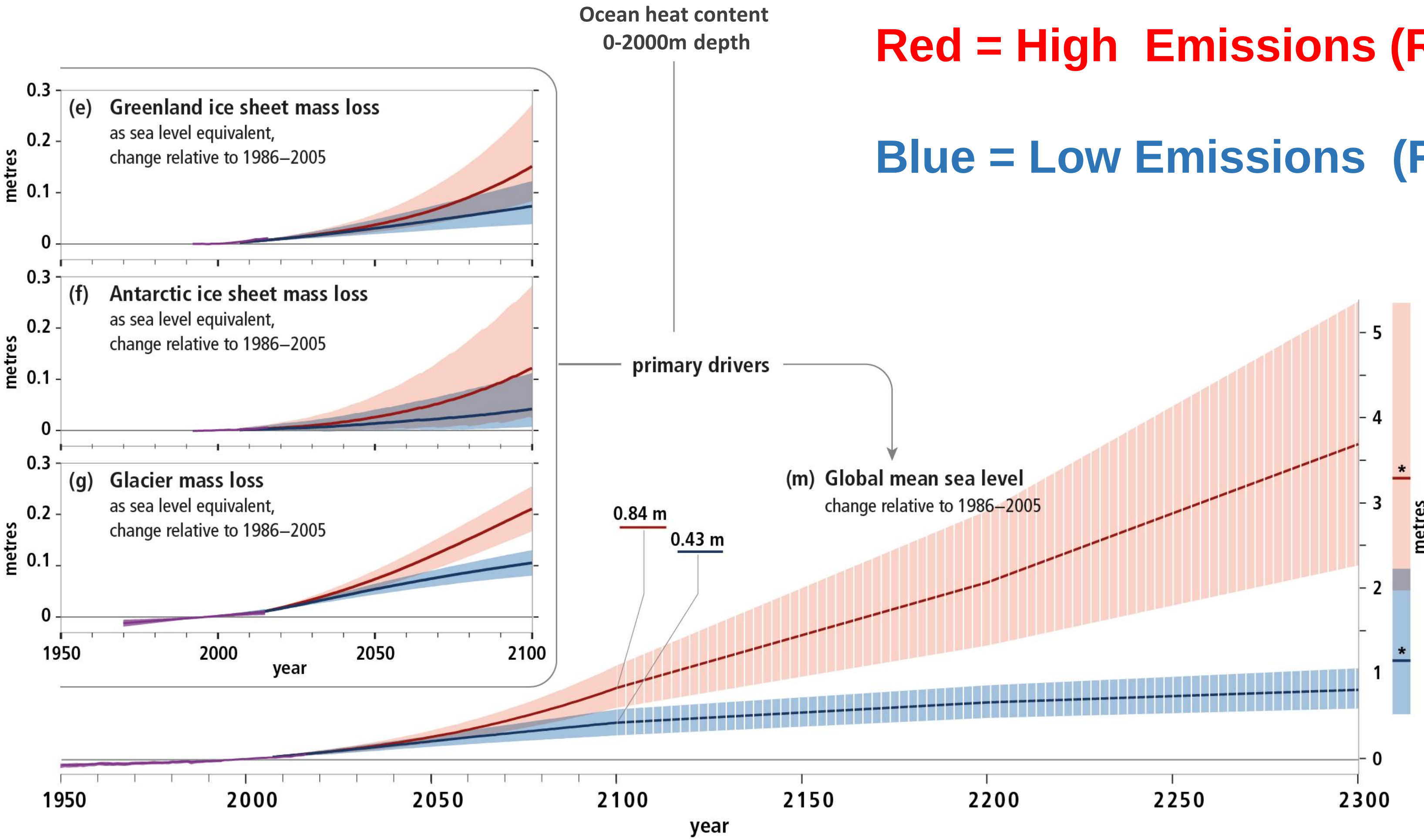
ERNMENTAL PANEL ON climate change

WMO UNEP

Impacts - Sea level change

Red = High Emissions (RCP8.5)

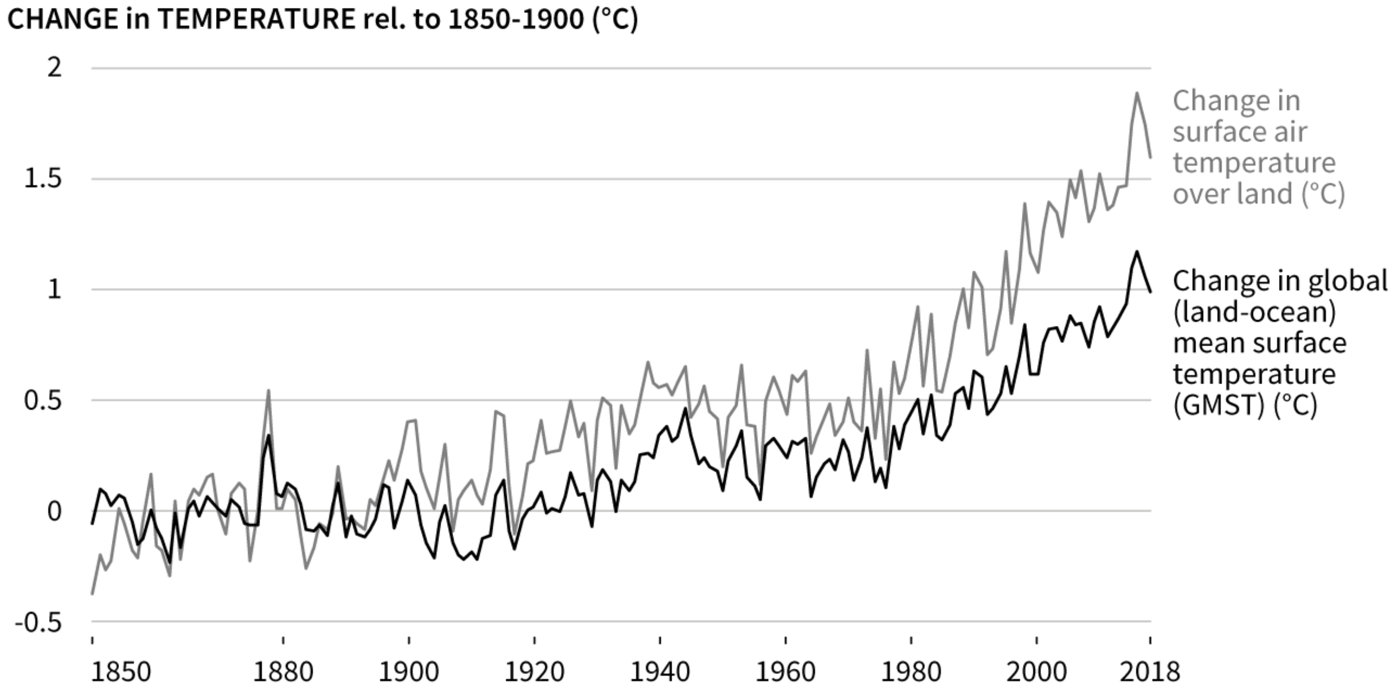
Blue = Low Emissions (RCP2.6)



SROCC Figure SPM.1, Panels E, F, G

INTERGOVERNMENTAL PANEL ON climate change

Impacts - Observed surface air temperature over **land** compared with **global** mean surface air temperature



SRCCL Figure SPM.1, Panel A

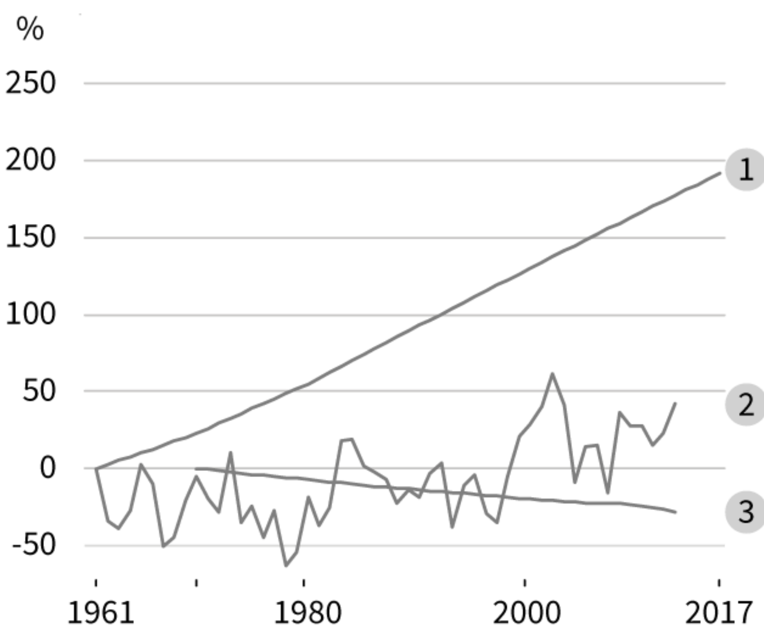
INTERGOVERNMENTAL PANEL ON climate change

Impacts – Desertification & 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

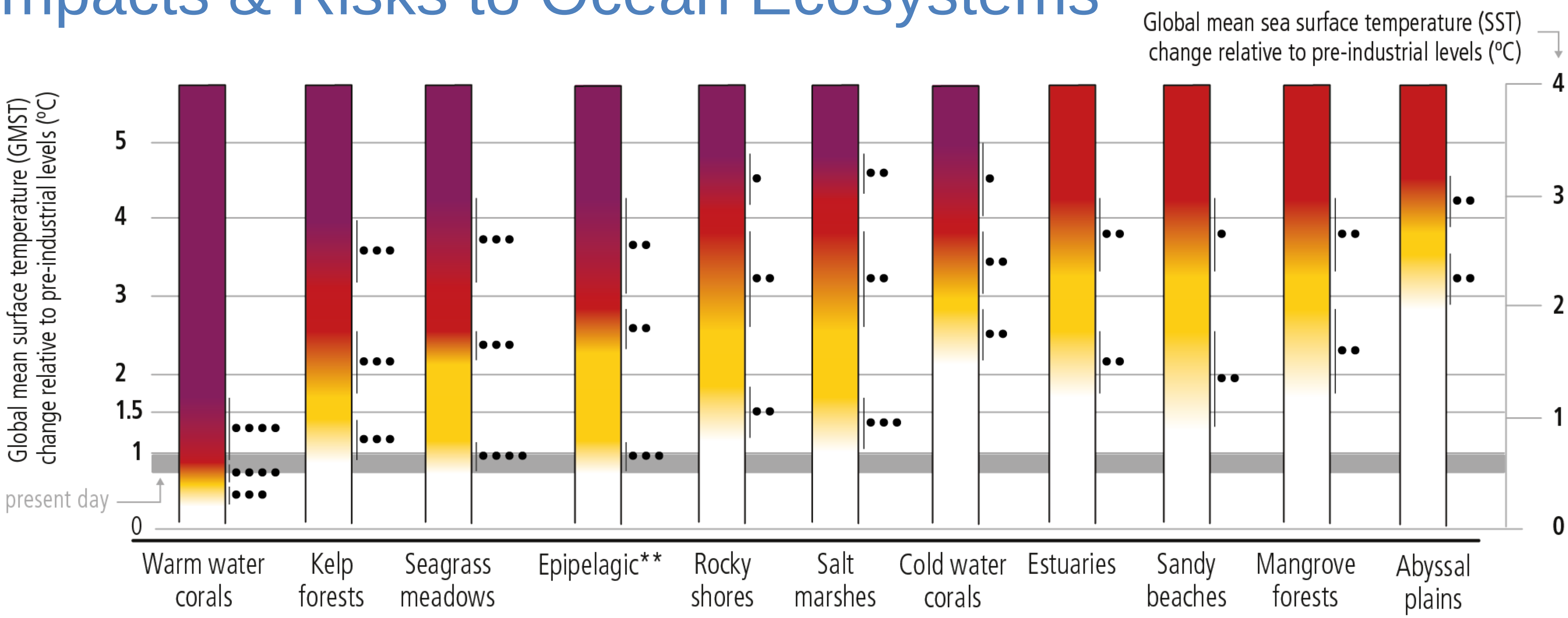
1 Population in areas experiencing desertification
2 Dryland areas in drought annually
3 Inland wetland extent



SRCCC Figure SPM.1, Panel F

INTERGOVERNMENTAL PANEL ON climate change

Impacts & Risks to Ocean Ecosystems



Level of added impacts/risks

- **Very high** — **Purple:** Very high probability of severe impacts/risks and the presence of significant irreversibility or the persistence of climate-related hazards, combined with limited ability to adapt due to the nature of the hazard or impacts/risks.
- **High** — **Red:** Significant and widespread impacts/risks.
- **Moderate** — **Yellow:** Impacts/risks are detectable and attributable to climate change with at least medium confidence.
- **Undetectable** — **White:** Impacts/risks are undetectable.

Confidence level for transition

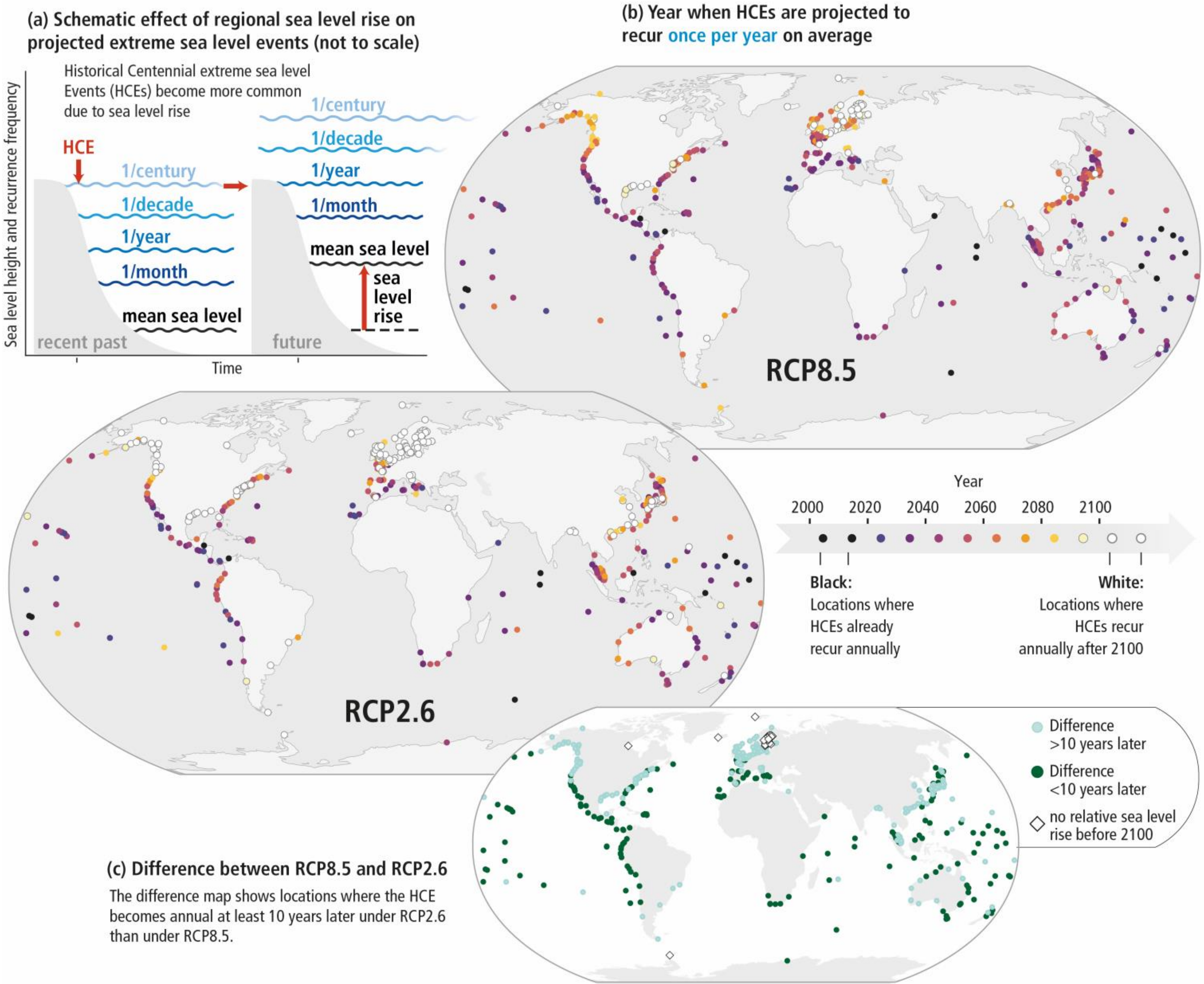
●●●● = Very high
●●● = High
●● = Medium
● = Low
| = Transition range

**see figure caption for definition

SROCC Figure SPM.3, Panel D

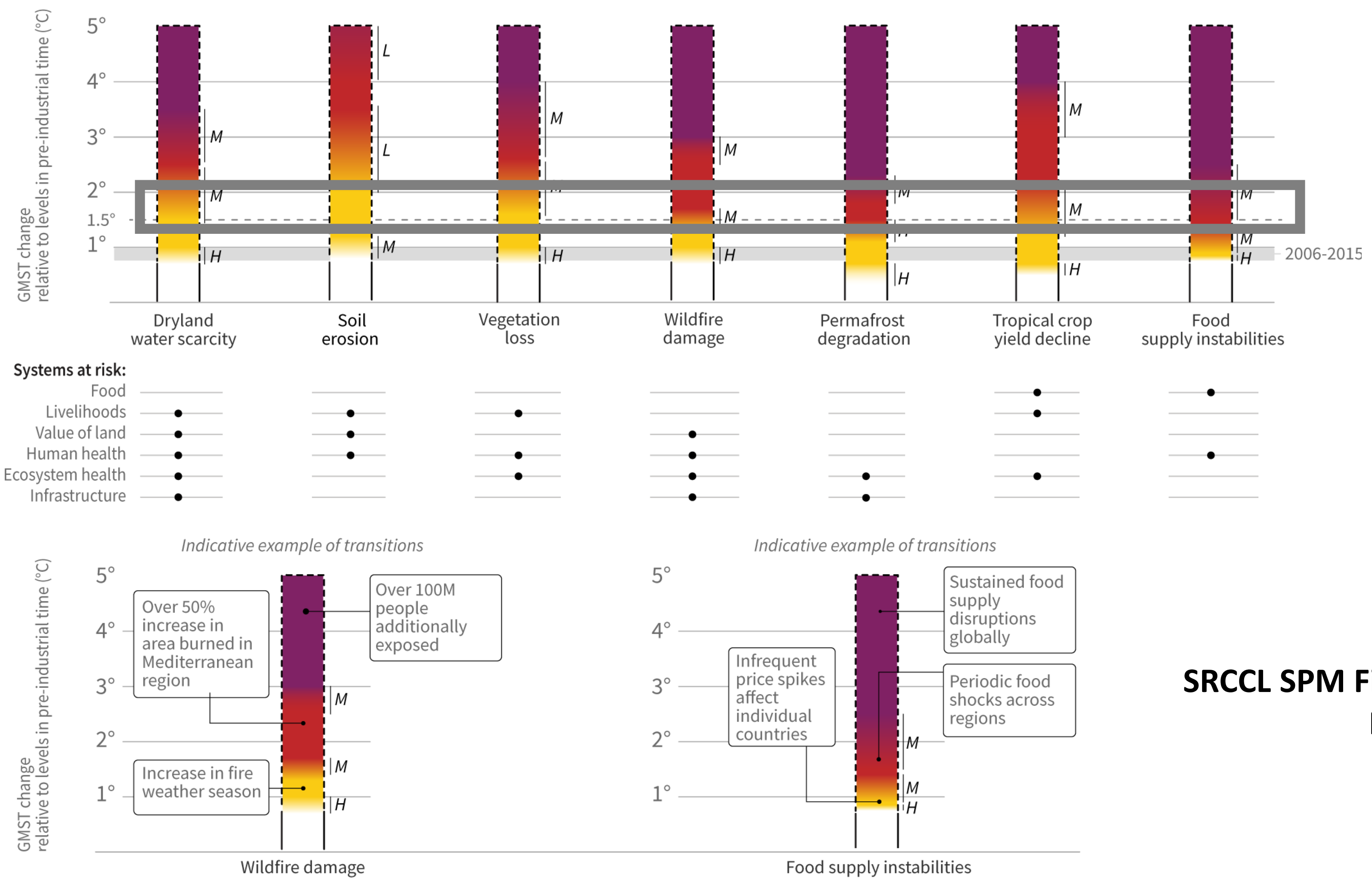
Extreme sea level events

Due to projected global mean sea level (GMSL) rise, local sea levels that historically occurred once per century (historical centennial events, HCEs) are projected to become at least annual events at most locations during the 21st century.
The height of a HCE varies widely, and depending on the level of exposure can already cause severe impacts. Impacts can continue to increase with rising frequency of HCEs.



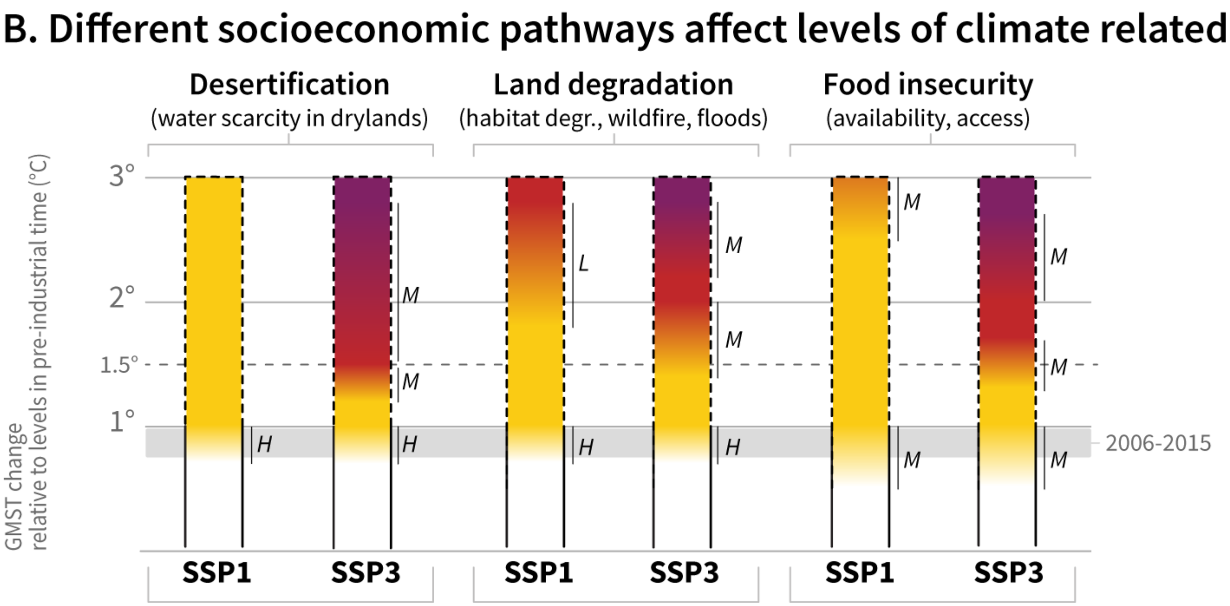
SROCC Figure SPM.4

Risks from Changes in Land-based Processes



SRCCL SPM Figure 2, Panel A

Risks from different socio-economic pathways



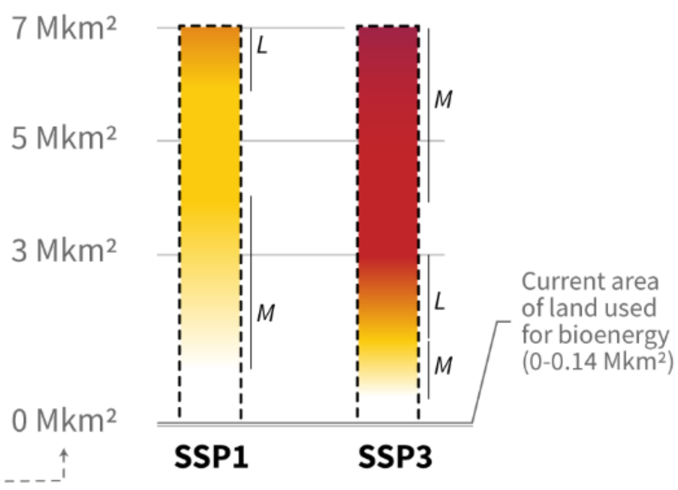
SRCCL SPM Figure 2, Panel B

INTERGOVERNMENTAL PANEL ON climate change

Risk from converting land to dedicated bioenergy

Risks from converting land to dedicated bioenergy

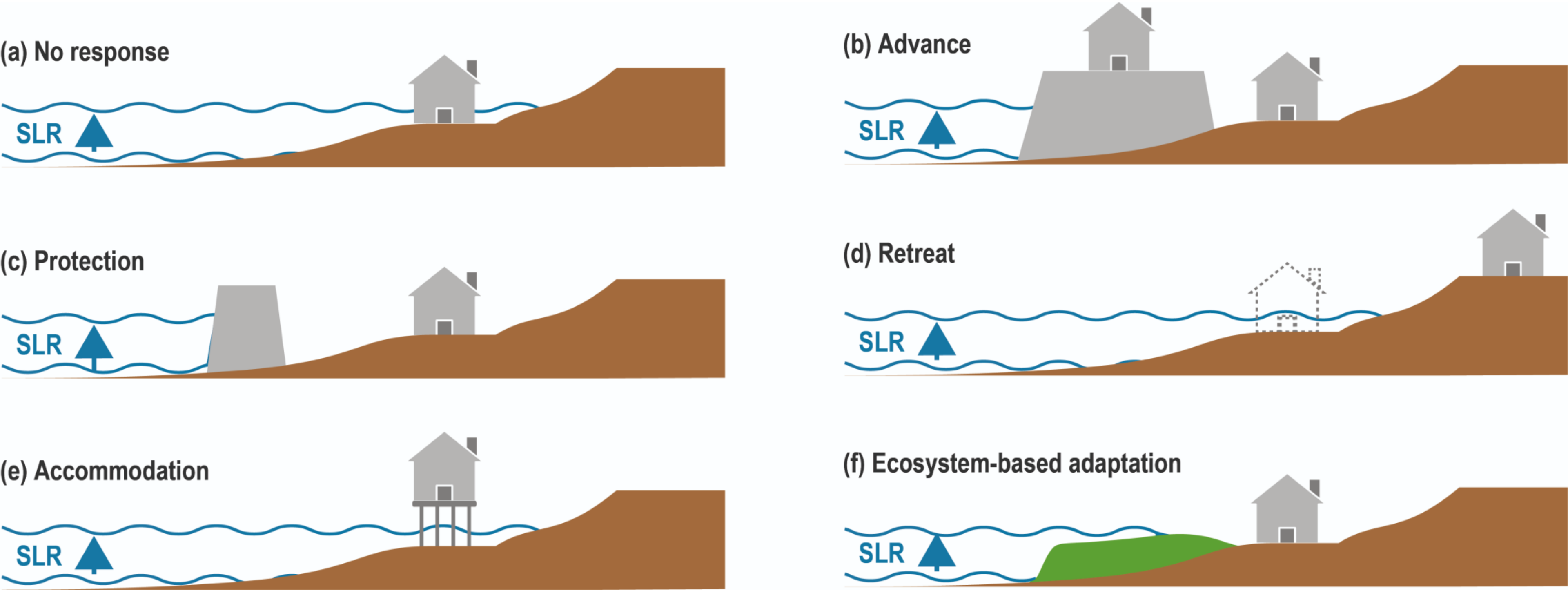
The additional amount of land used for dedicated bioenergy crops in 2050 under a 2°C warming target affects the combined risks related to **food systems**, **terrestrial ecosystems** and **water scarcity**. Risks depend on scale, feedstock, and location, as well as on land management, land demand for food, societal norms, and governance (represented here by contrasting SSPs). Land restoration co-benefits are possible at various scales of deployment. In a world with lower land requirements for food production (SSP1), there is greater opportunity for sustainable bioenergy deployment compared to a world in which there is increasing competition for land (SSP3).



SRCCL Chapter 7 Figure 7.3

INTERGOVERNMENTAL PANEL ON climate change

Different types of responses to coastal risk and sea level rise



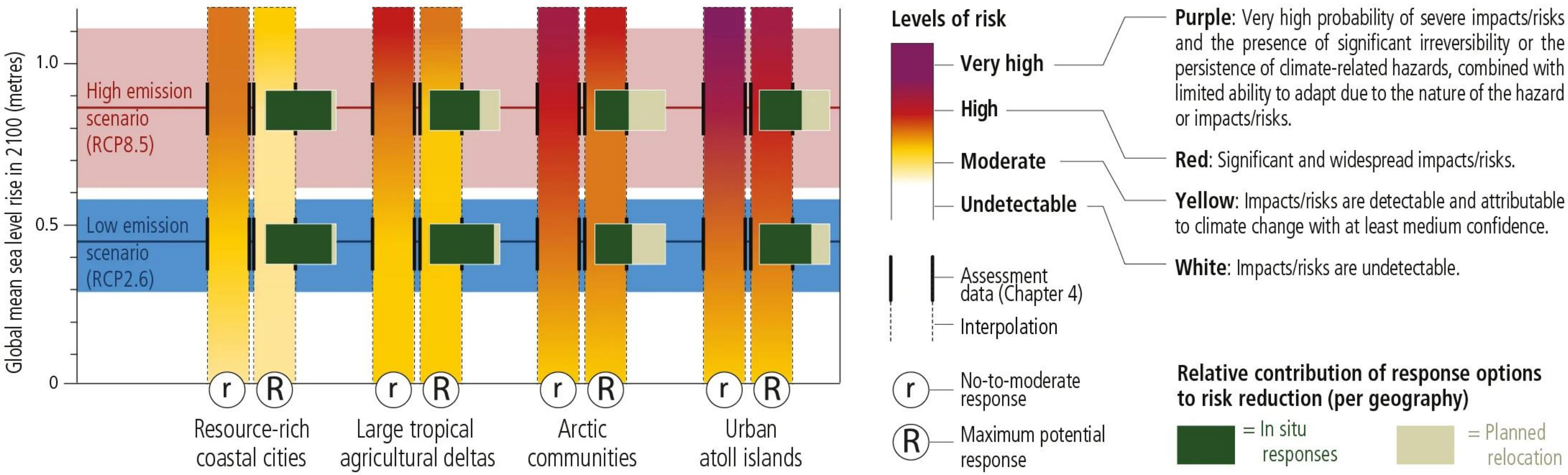
SROCC Box 4.3, Figure 1

Sea level rise risks & responses

The term response is used here instead of adaptation because some responses, such as retreat, may or may not be considered to be adaptation.

(a) Risk in 2100 under different sea level rise and response scenarios

Risk for illustrative geographies based on mean sea level changes *(medium confidence)*



R = Maximum potential response

r = No-to-moderate response

SROCC Figure SPM.5, Panel A

Knowledge Gaps?

- Knowledge Gaps filled since last SED
  - ✓ Increasing understanding of diversity of impacts and risks
  - ✓ Increasing awareness of adaptation needs
  - ✓ Increased understanding of costs of inaction

- Remaining knowledge gaps
  - Impacts of rate of climate change on risk, risk tolerance
  - Adaptation limits, maladaptation, effectiveness of adaptation
  - Quantified savings/ avoided losses from timely action

Conclusion

- There is increasing evidence that several climate-related physical changes to ocean and cryosphere have accelerated over recent decades, and that land is under increasing pressure.
- Risk increases with any additional warming but risk also strongly depends on development choices and on the ability to implement response options early.
- Many changes will continue up to 2100 and beyond under all scenarios, generating an unavoidable long-term commitment to increasing impacts and risk.
- However, the rate and amount of change (e.g., in sea level) are minimized under low emission scenarios.