2da Conferencia Regional sobre el IPCC

Cambio climático: conocimiento y soluciones hacia la COP26

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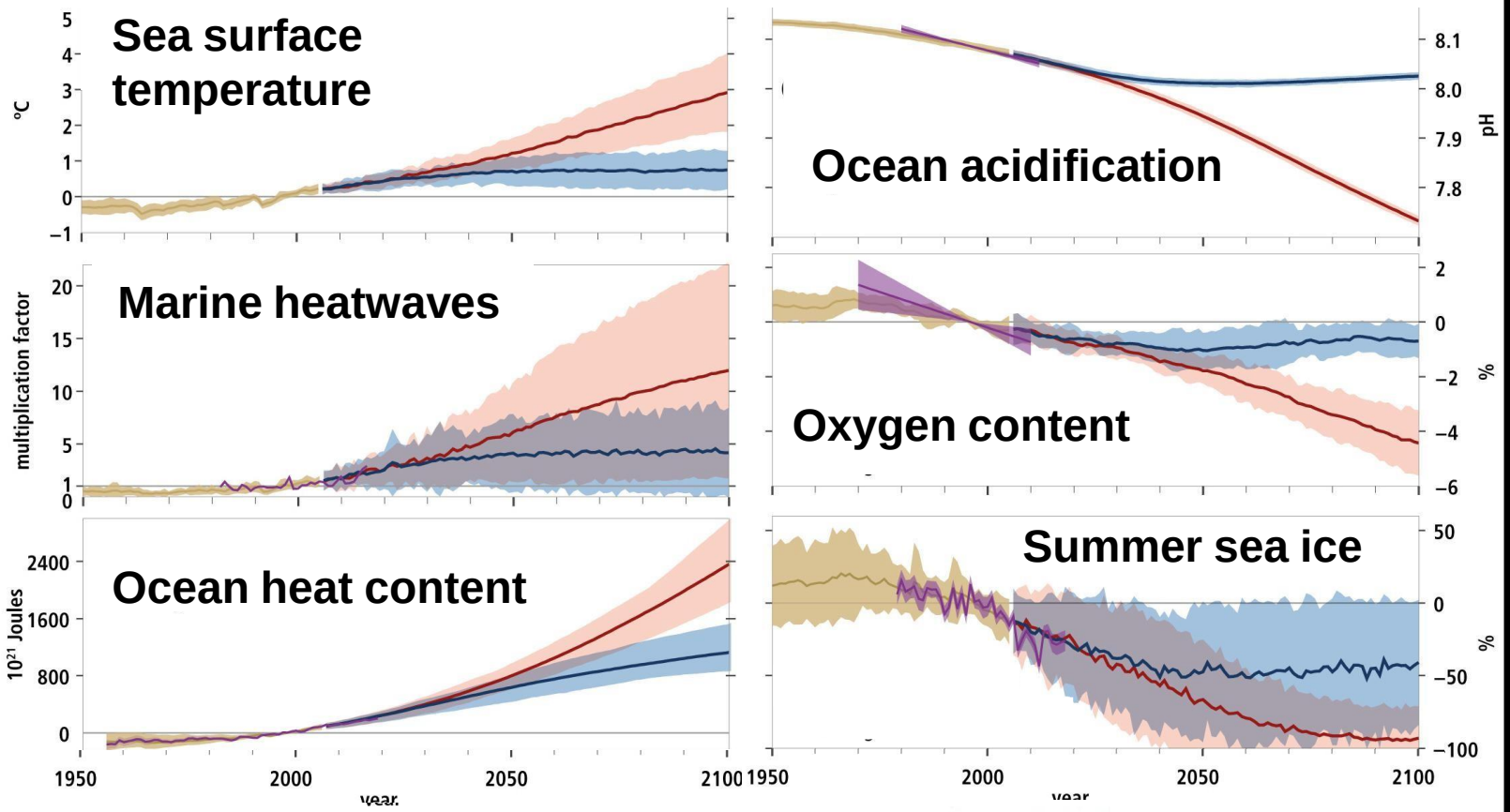
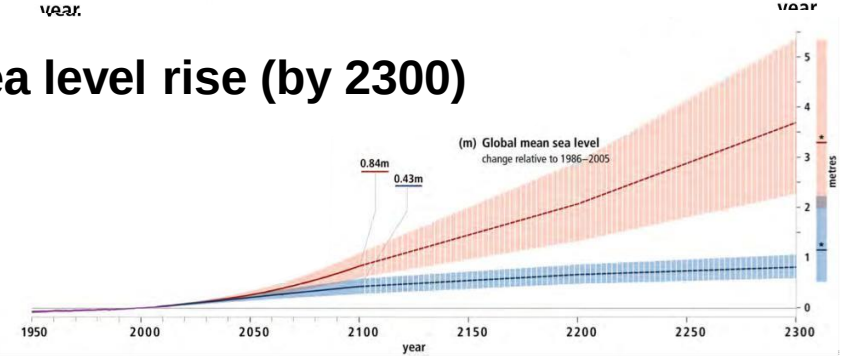
Ocean changes with carbon emissions



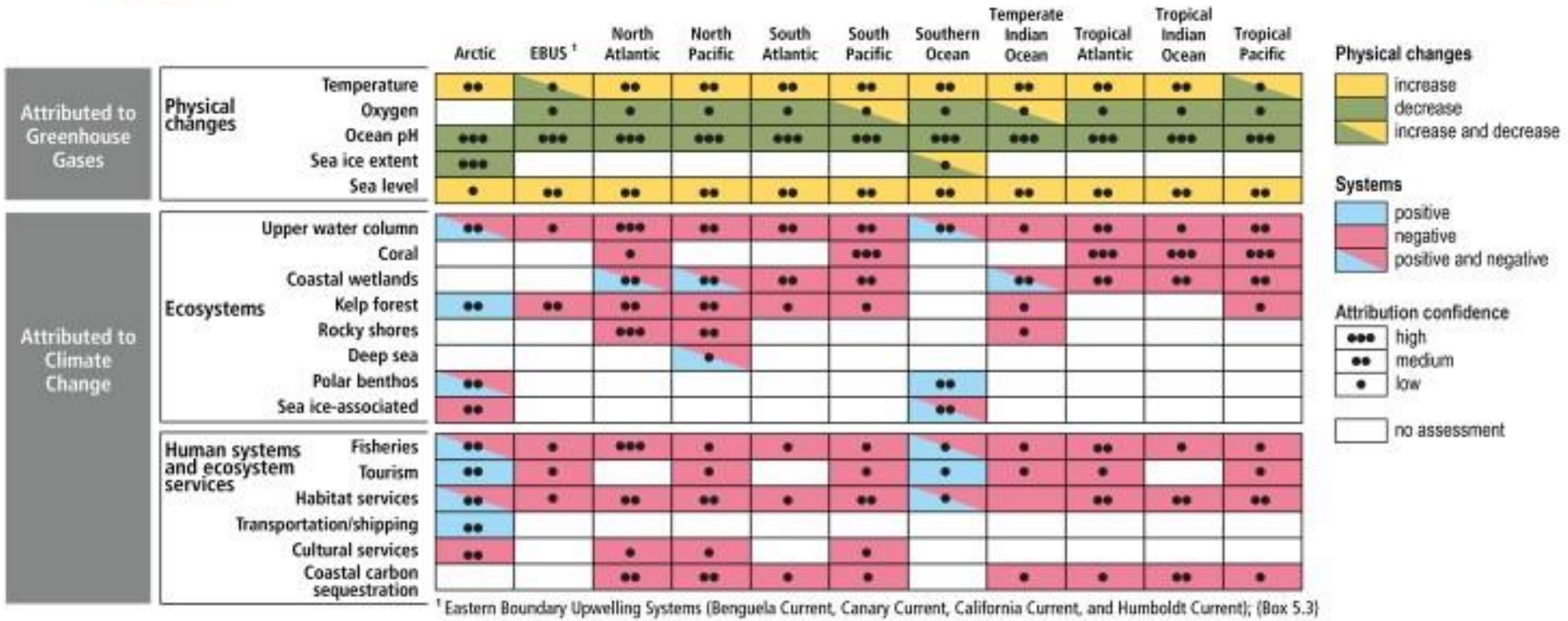
Sea level rise (by 2300)



- **Ocean warming** has more than doubled;
- **Marine heatwaves** have doubled in frequency;
- **Ocean acidification** is intensifying as more CO_2, is absorbed;
- **Oxygen minimum zones** expanded by 3-8%;
- **Arctic sea ice** will disappear once every three years under 2 °C global warming;
- Sea level rise could reach up to > 1m.

IPCC (2019) SROCC SPM

Observed regional hazards and impacts in the ocean



[1] Eastern Boundary Upwelling Systems (Benguela Current, Canary Current, California Current, and Humboldt Current); (Box 5.3)

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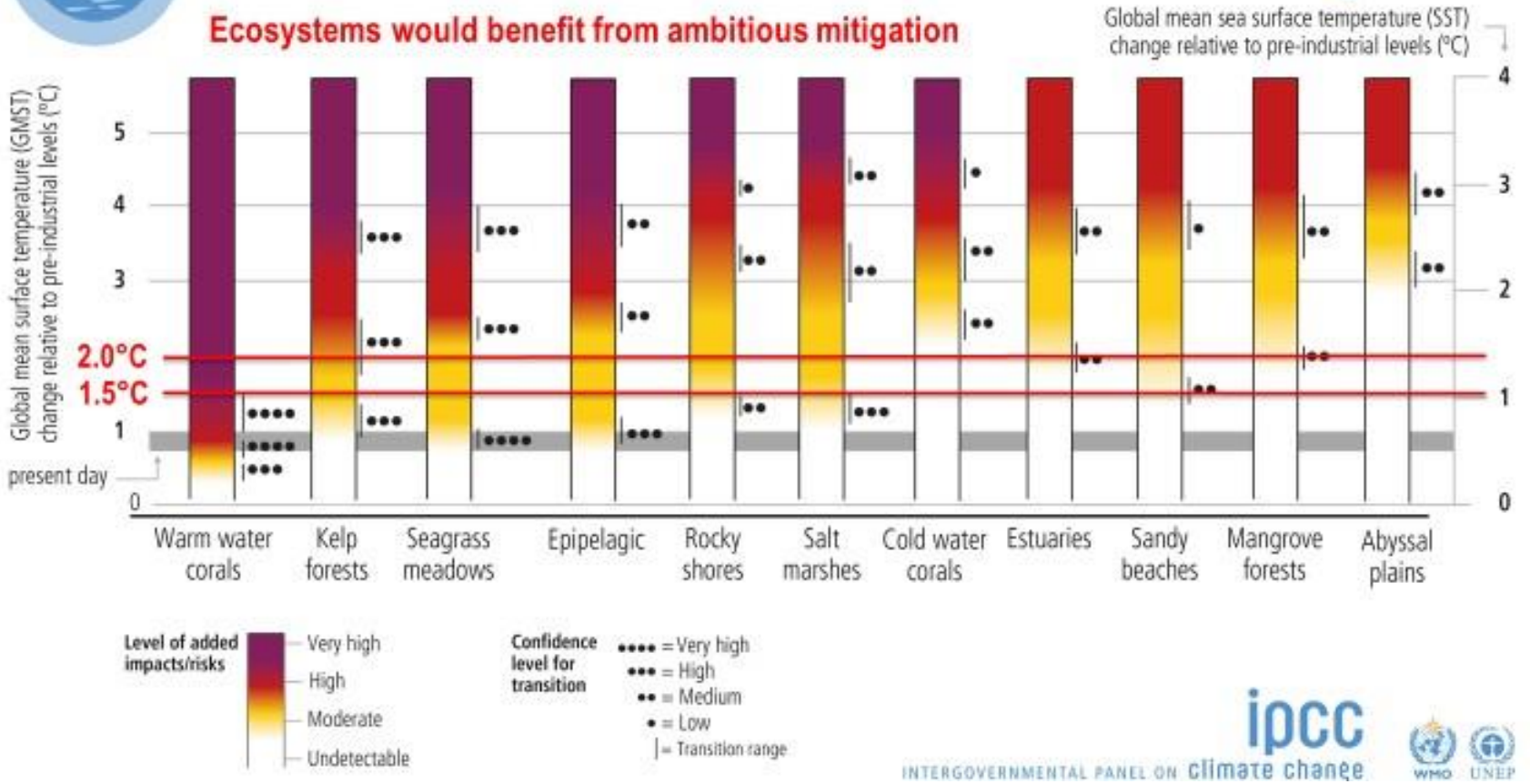
Future risks for ocean and coastal ecosystems



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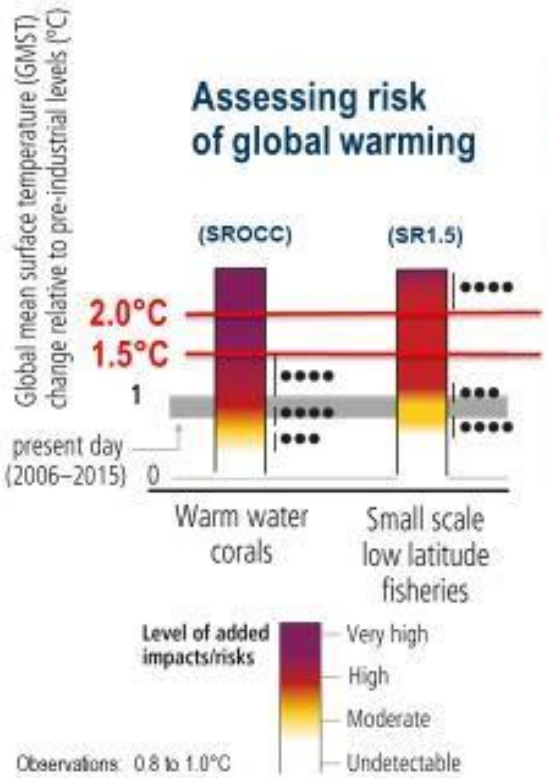
Warm water Coral Reefs

Vulnerable Ecosystems identified in AR5, SR1.5, SROCC



Even in a 1.5°C warmer world.... high risk of losing 70 to 90% of Coral Reefs and associated services for humankind ... even more at 2°C

Confidence level for transition

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

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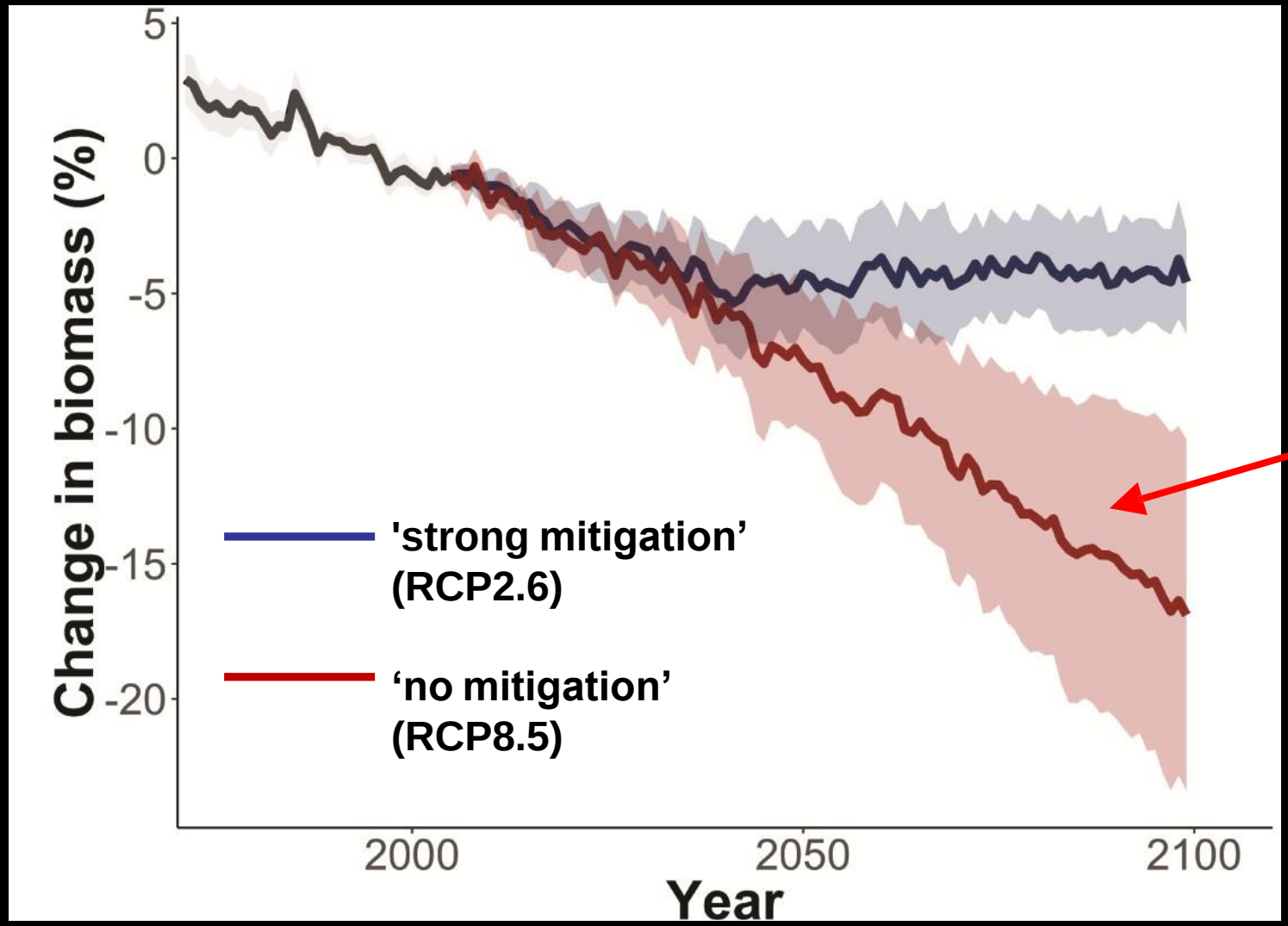
Projected loss of 1/5 of total marine animal biomass in the global ocean



Ensemble of 10 climate-living marine resources models

Driven largely by ocean warming and decrease in net primary production.

Bindoff, Cheung *et al*. (2019) SROCC Chapter 5

Projecting impacts in the ocean

Changing ocean conditions

Net primary production

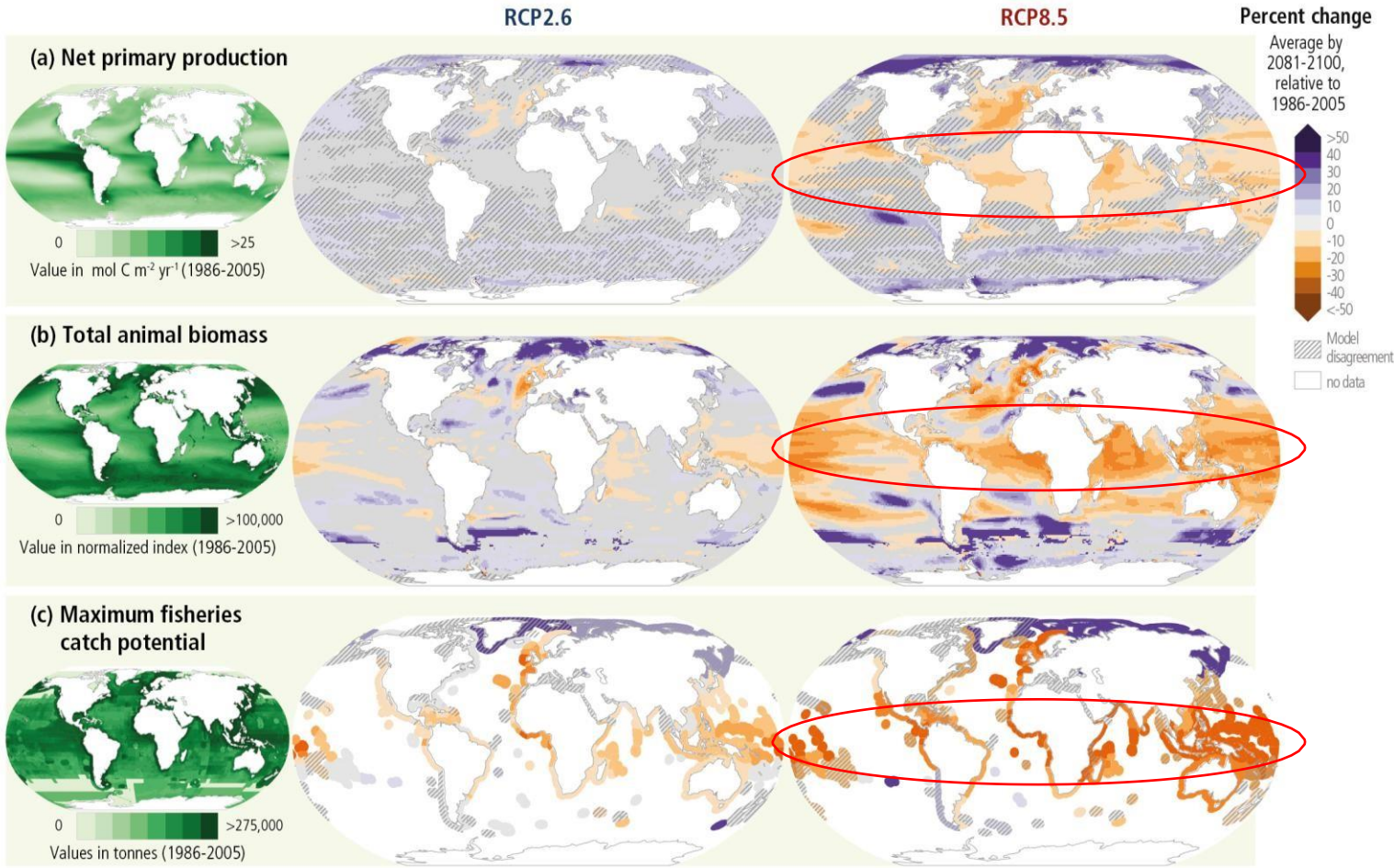
Provide carbon and energy for foodweb

Total animal biomass

Biomass of organisms in the upper part of the foodweb

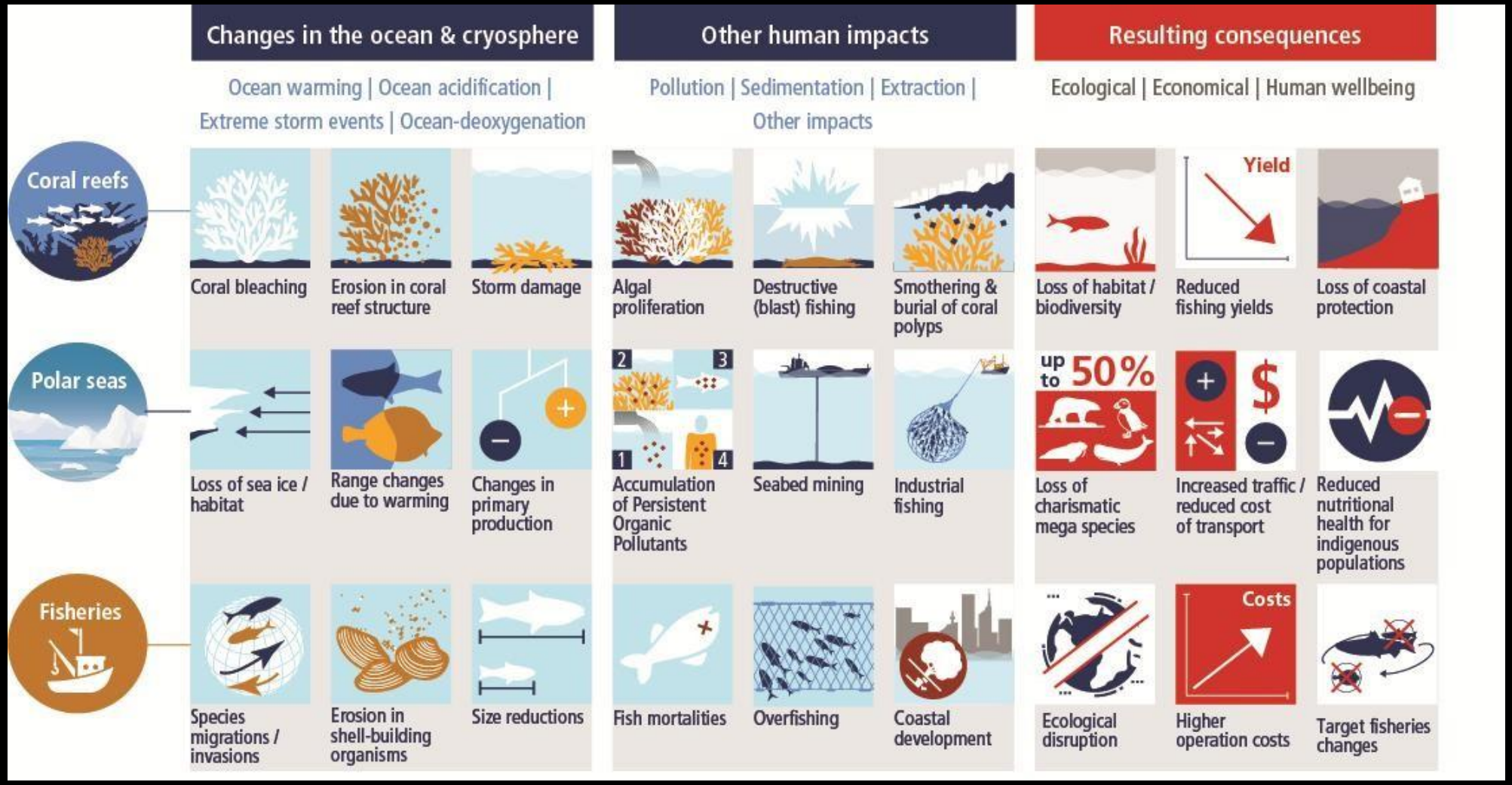
Maximum fisheries catch potential

Proxy of maximum



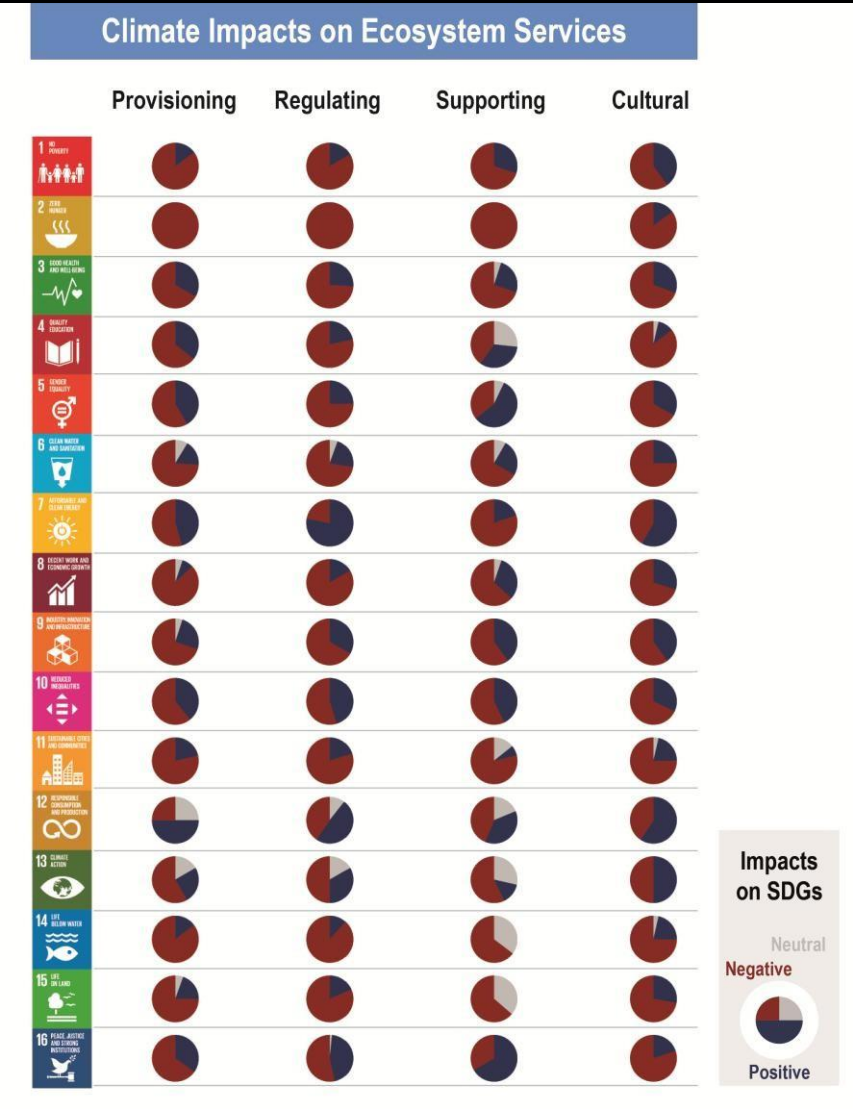
IPCC (2019) SROCC SPM

IPCC SROCC: widespread climate- impacts and risks for the tropics to poles and people worldwide



IPCC (2019) FAQ Chapter 5

Impacts on sustainable development goals (SDGs)



Bindoff, Cheung *et al*. (2019) SROCC Chapter 5

Climate change impacts on marine ecosystem services reduce the society's ability to achieve most other sustainable development goals.

Our ocean and cryosphere –
They sustain us.
They are under pressure.
Their changes affect all our lives.

The time for action is now.

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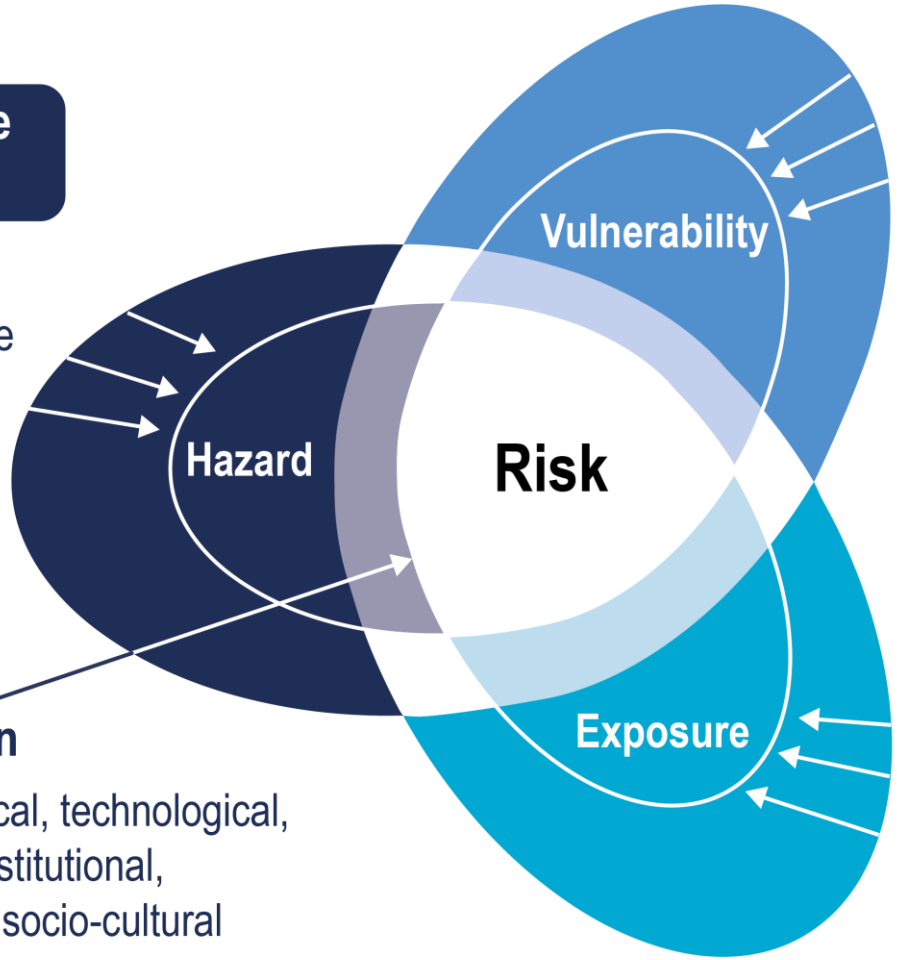
Options for risk reduction through adaptation

Actions to reduce Hazards

Examples include:

- Mangroves to alleviate coastal storm energy



Actions to reduce Vulnerability

Examples include:

- Hazard-proof housing and infrastructure

Limits to Adaptation

- E.g. physical, ecological, technological, economic, political, institutional, psychological, and/or socio-cultural

Actions to reduce Exposure

Examples include:

- Risk sensitive land use planning

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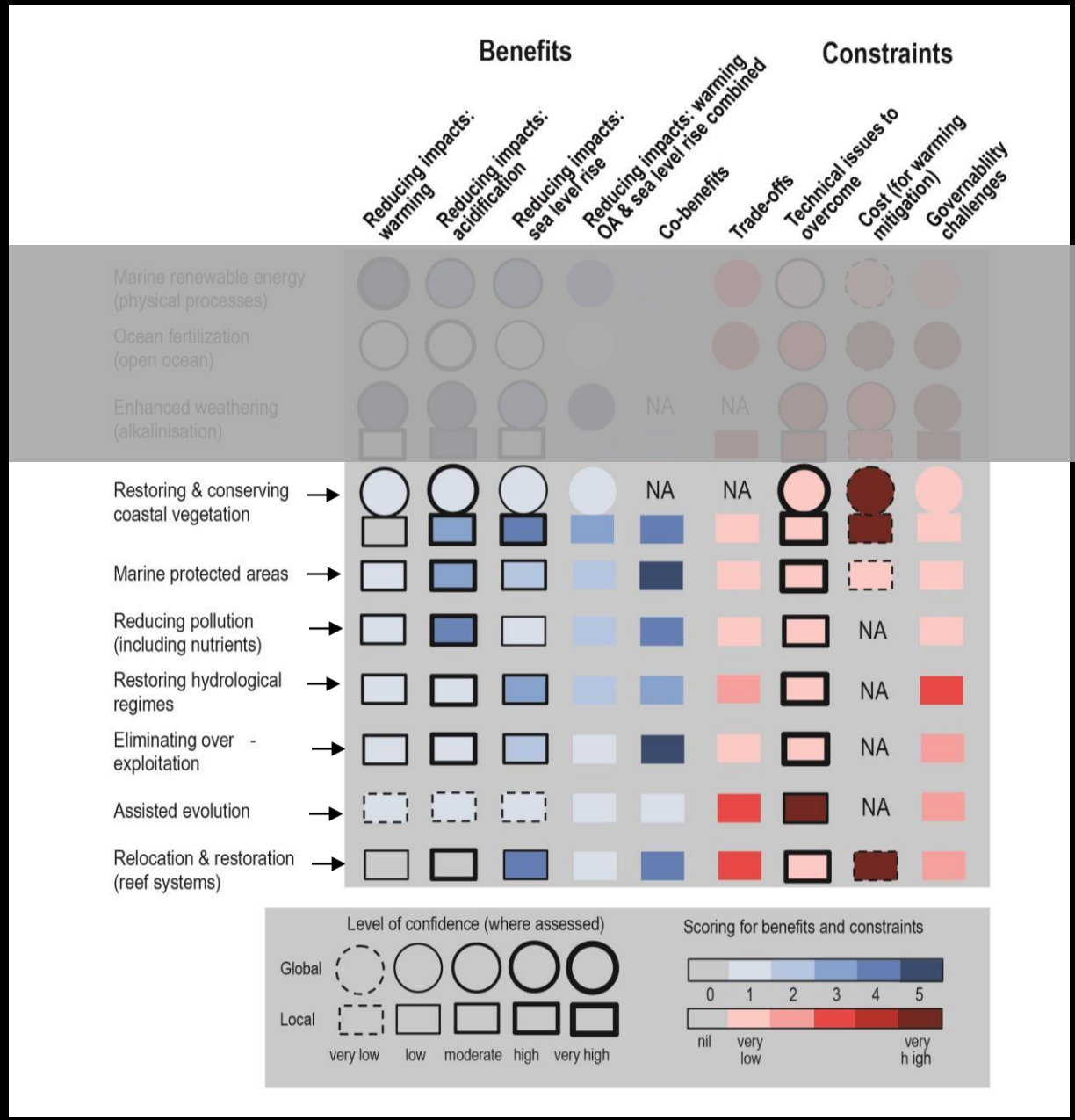
Wide-range of ocean-based response options are available

- Supported by protection, restoration, precautionary ecosystem-based management of renewable resource use, reduction of pollution and other stressors

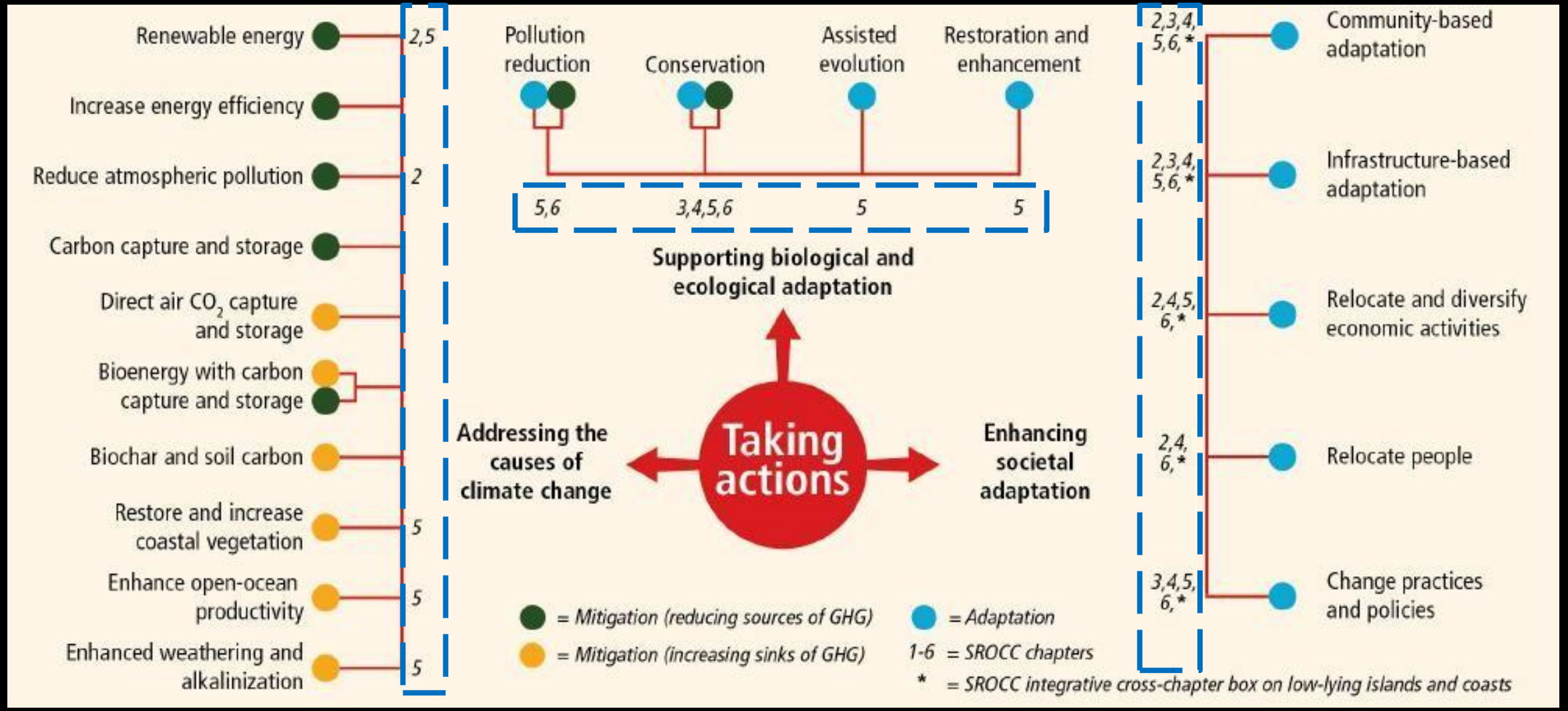
- Moderate to high benefits to local climate-risk reduction

- High/very high co-benefits and low trade-offs.



Bindoff *et al*. (2019) SROCC Chapter 5

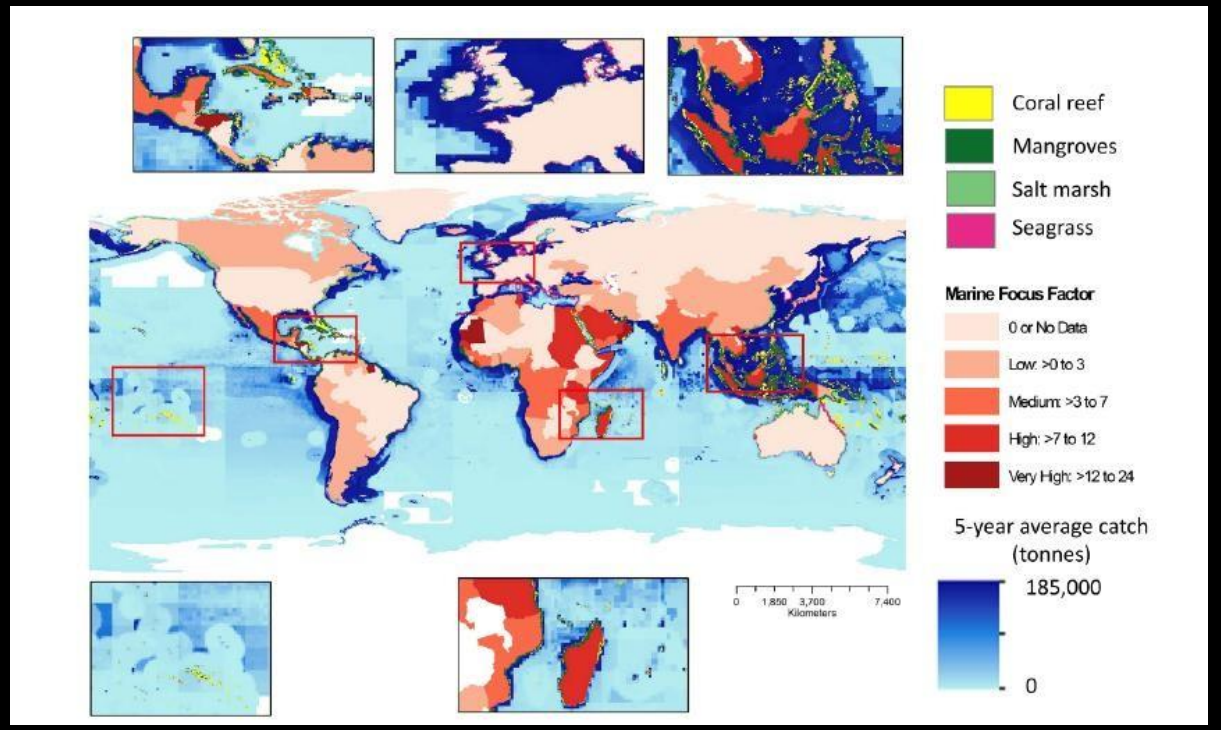
Specific policy responses in the context of adaptation and nature-based solutions (including ”blue carbon”)



Ahram et al. (2019) SROCC Chapter 1

Restoration of vegetated coastal ecosystems

- Could increase carbon uptake and storage of ~0.5% of current global emissions annually;
- Co-benefits: providing storm protection, improving water quality, benefiting biodiversity and fisheries.

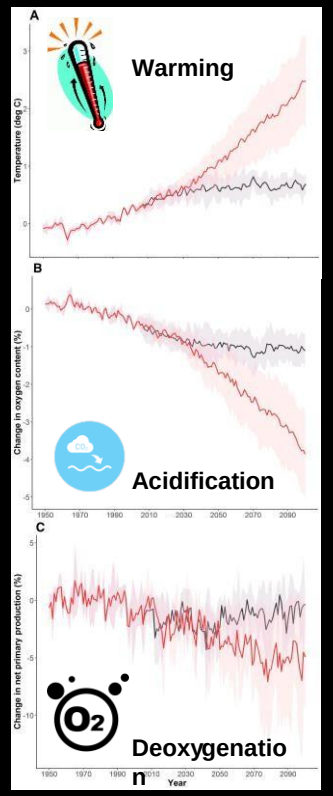


Bindoff *et al*. (2019) SROCC Chapter 5

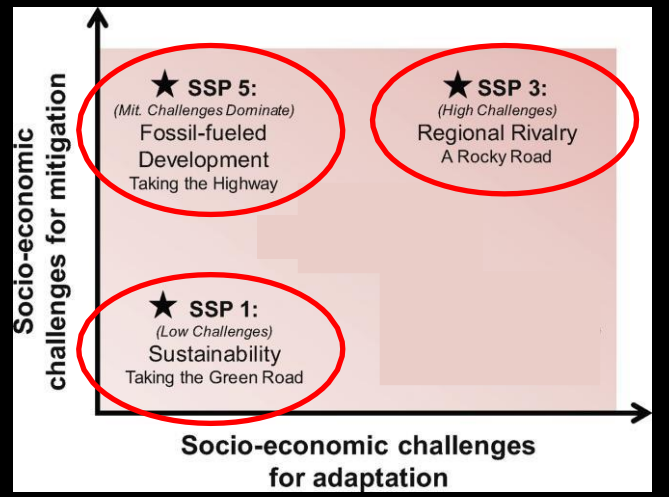
Ecosystem-based management can help improve climate-resilient e.g., the high seas

Global societal changes

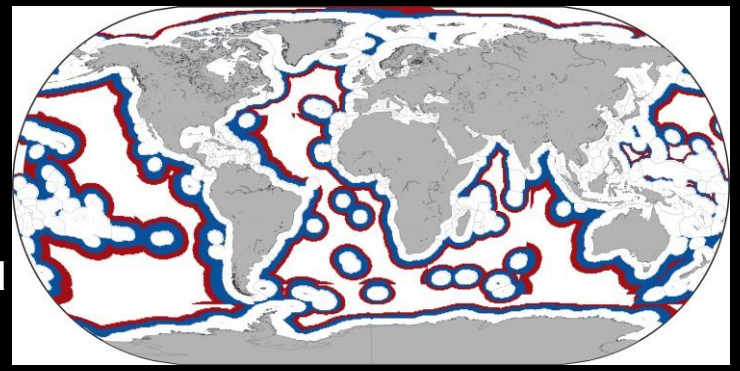
Climate change



Benefits of large MPAs in the high seas to reduce climate impacts



Marine Protected Area options



Marine conservation priorities under climate change

- Climate sensitive ecosystems e.g., coral reefs, kelp forest and region: tropical ocean
- Wide range of ocean-based solution options are available – many with high co-benefits;
- Key challenges: time-scale, boundaries (e.g. jurisdictional/sectoral), and barriers/limits to adaptation;
- Most adaptation options are only effective under low greenhouse gas emission scenarios – ultimately, global-scale solution requires transformative changes.

Challenges of policy responses

- Time-scale mis-match:
  - ❖ Impacts operate on time horizons longer than those of governance arrangements;
  - ❖ Earlier emergence of some climate hazards and risks challenges the longer time-frame of designing and implementing policies;
  - ❖ Scope and benefits of climate responses effectives reduce higher greenhouse gas emission and delayed responses
- Barriers and limits to adaptation;
  - ❖ Financial, technological, institutional etc.;
  - ❖ Space, non-climatic drivers, lowering of adaptive capacity, slow inherent response rate.

SROCC: Knowledge for action

- Highlights the **urgency** of prioritizing timely, ambitious and coordinated action to address widespread and enduring changes in the ocean and cryosphere
- Shows that **protecting and restoring ecosystems** and careful management of natural resources **can reduce risks** and provide multiple societal benefits
- Empowers people, communities and governments to tackle the **unprecedented transitions in all aspects of society**
- Provides evidence of the **benefits** of combining scientific with local and indigenous knowledge
- Focuses, for the first time, on the **importance of education and climate literacy**

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The more decisively and earlier we act, the more able we will be to address unavoidable changes, manage risks, improve our lives and achieve sustainability for ecosystems and people around the world – today and in the future.

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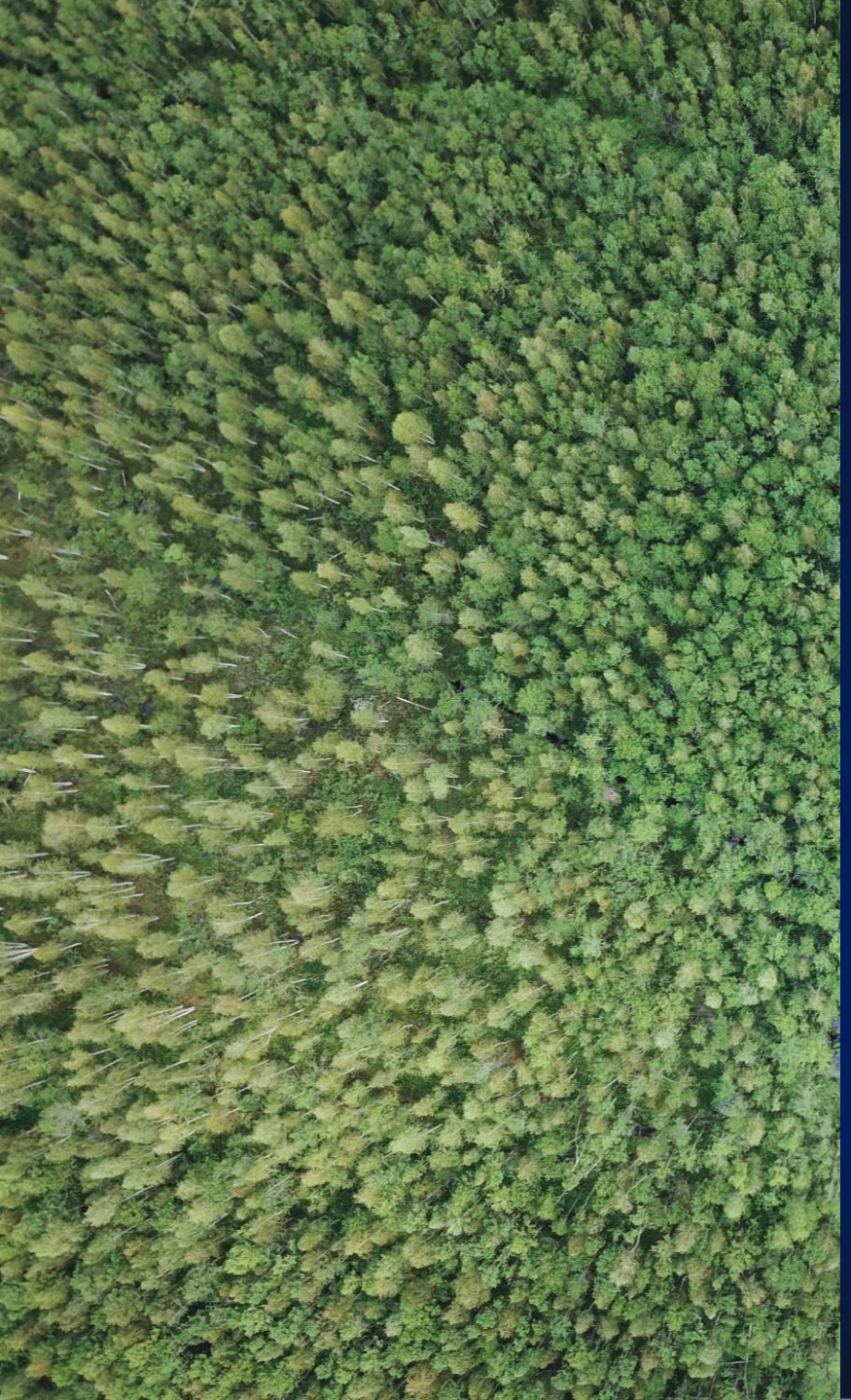
Thank you



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