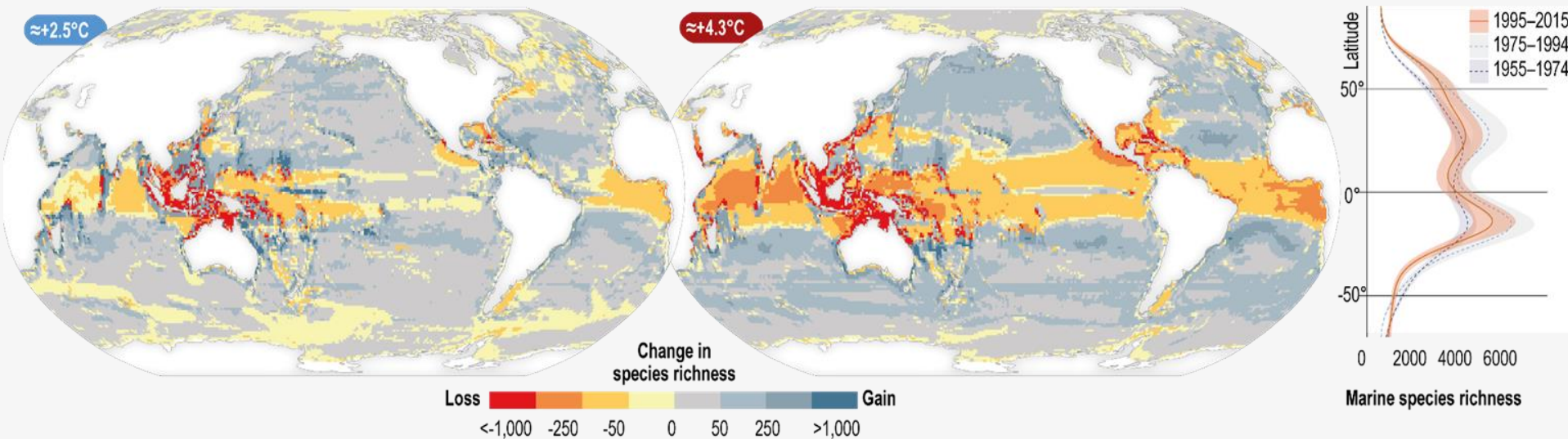




UN Ocean ID 3: Minimizing and addressing ocean acidification, deoxygenation and ocean warming

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Co-Chair IPCC WGII and Co-Chair IPBES IPCC workshop and report*

Heat induced habitat change, shift and loss



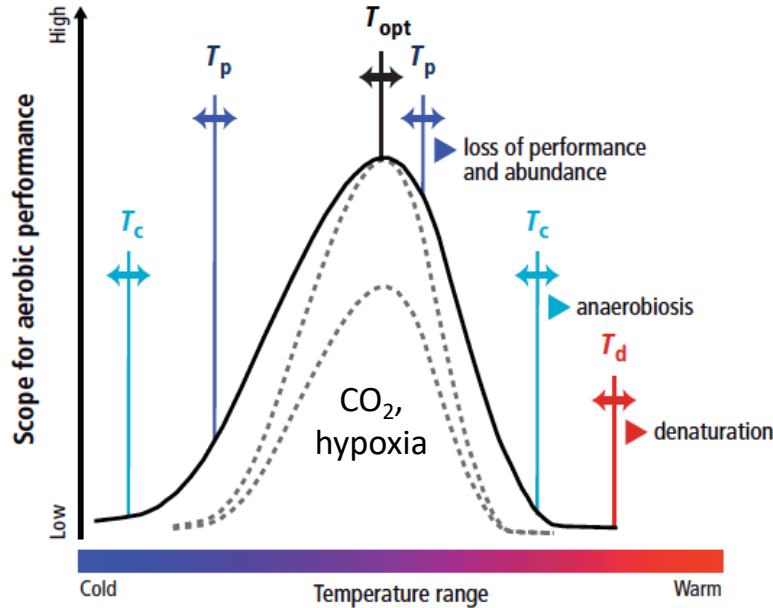
Current drivers of change: **Warming and warming velocity....**

Shifting Biogeographies, Species interactions and Community composition

...a role for oxygen and CO_2 ?

...improving baseline understanding

(a) Thermal windows for animals: limits and acclimatization



Common functional background for all organisms:

specialization on limited ranges of ambient temperature,

reflected in dynamic thermal performance curves, constrained by other drivers (CO_2 , hypoxia etc.)

threshold line



acclimatization and adaptation



Performance curve under normal conditions

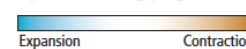


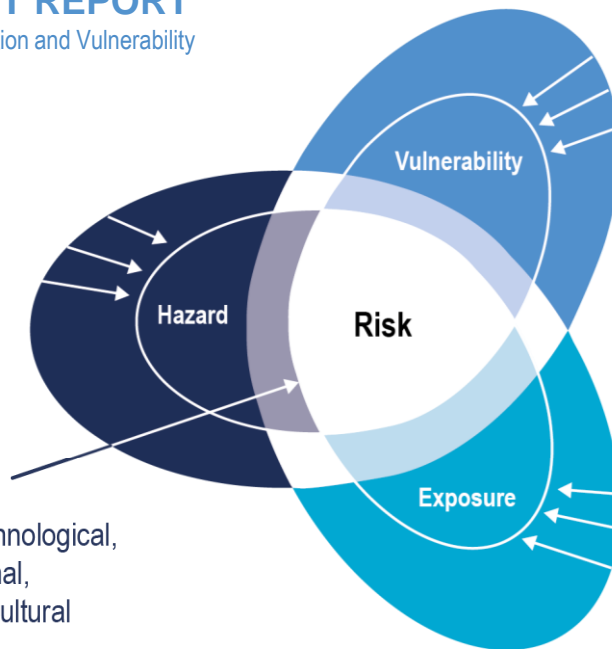
Performance curve options under elevated CO_2 or in hypoxic water or both

Species abundance



Spatial dynamics during progressive warming

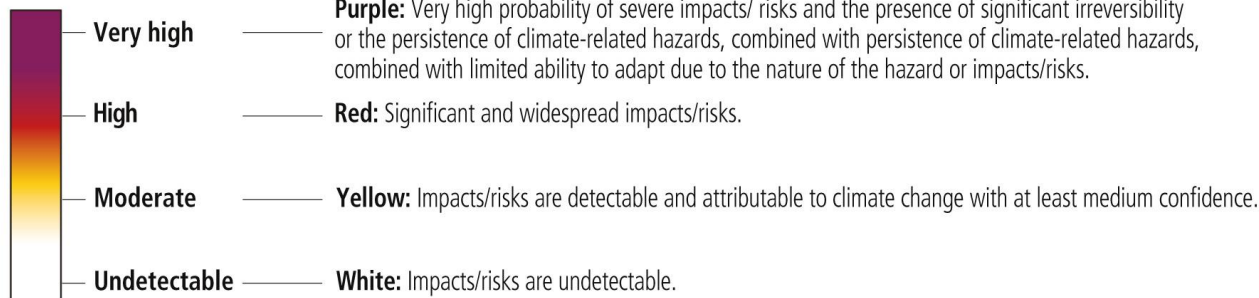




Limits to Adaptation

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

Level of added impacts/risks



Climate change causes risks...

The IPCC concept of risk

Climate action entails risk reduction by adaptation and mitigation considering limits to adaptation

Confidence level for transition

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

**see figure caption for definition

Coastal and ocean risk include those of warming, acidification and hypoxia

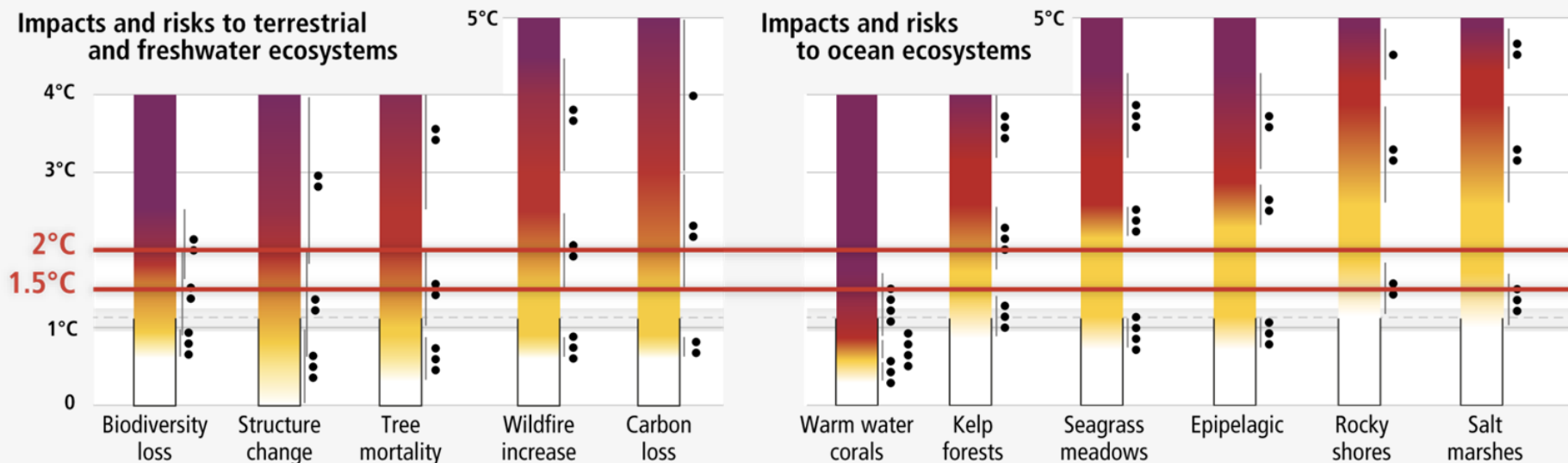
WGII identified 127 global and regional key risks

Examples of key risks for Small Islands

- **Loss of biodiversity and ecosystem services** (terrestrial, marine and coastal)
- **Loss of lives and assets**, risk to **food security** and **economic disruption** due to destruction of settlements and infrastructure
- **Economic decline and livelihood failure** of fisheries, agriculture, tourism and from biodiversity loss from traditional agro-ecosystems
- **Reduced habitability** of reef and non-reef islands leading to increased displacement, **loss of human habitat**
- **Risk to water security** in almost every small island

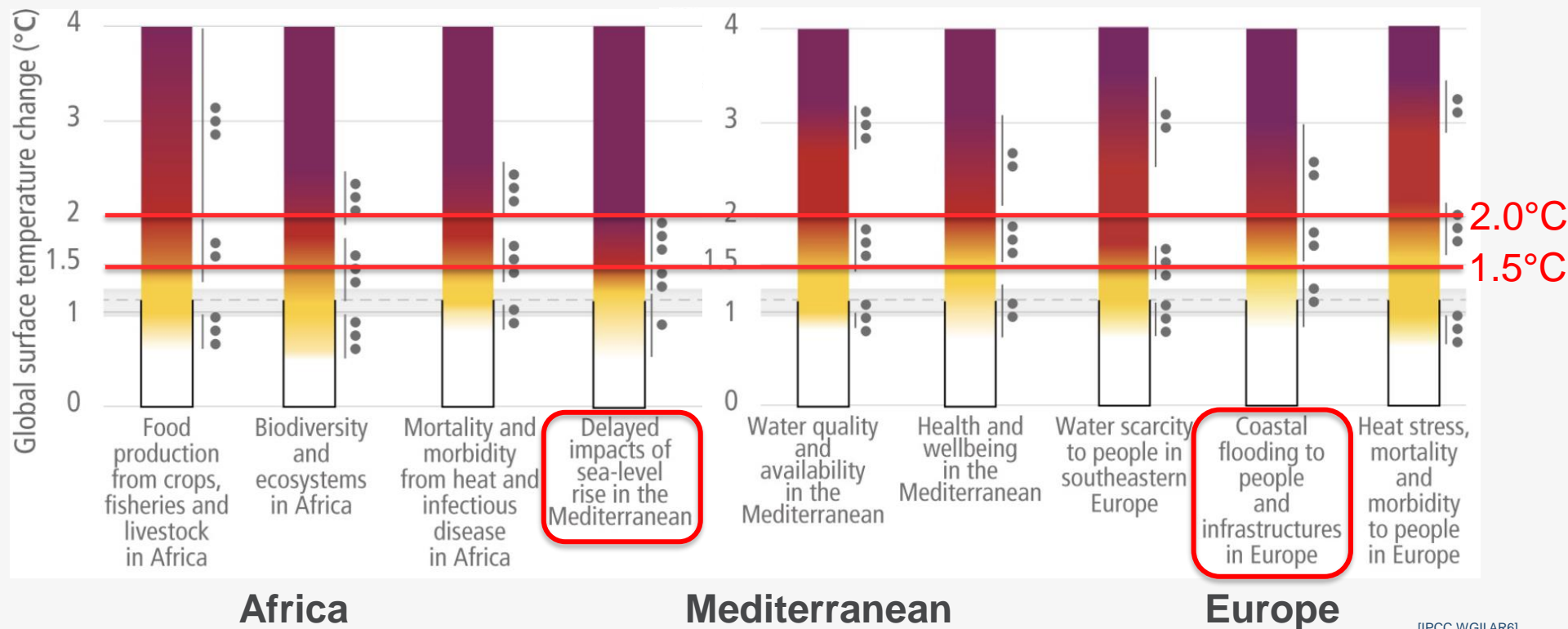
Global and regional risk provide orientation for action

... risk can be kept at moderate more often by keeping global warming below **1.5°C**



Global and regional land and ocean risk provide orientation for action (adaptation/mitigation)

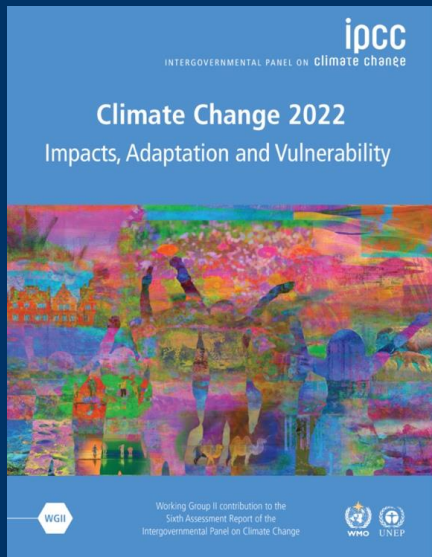
... avoiding high risk by keeping global warming below 1.5°C



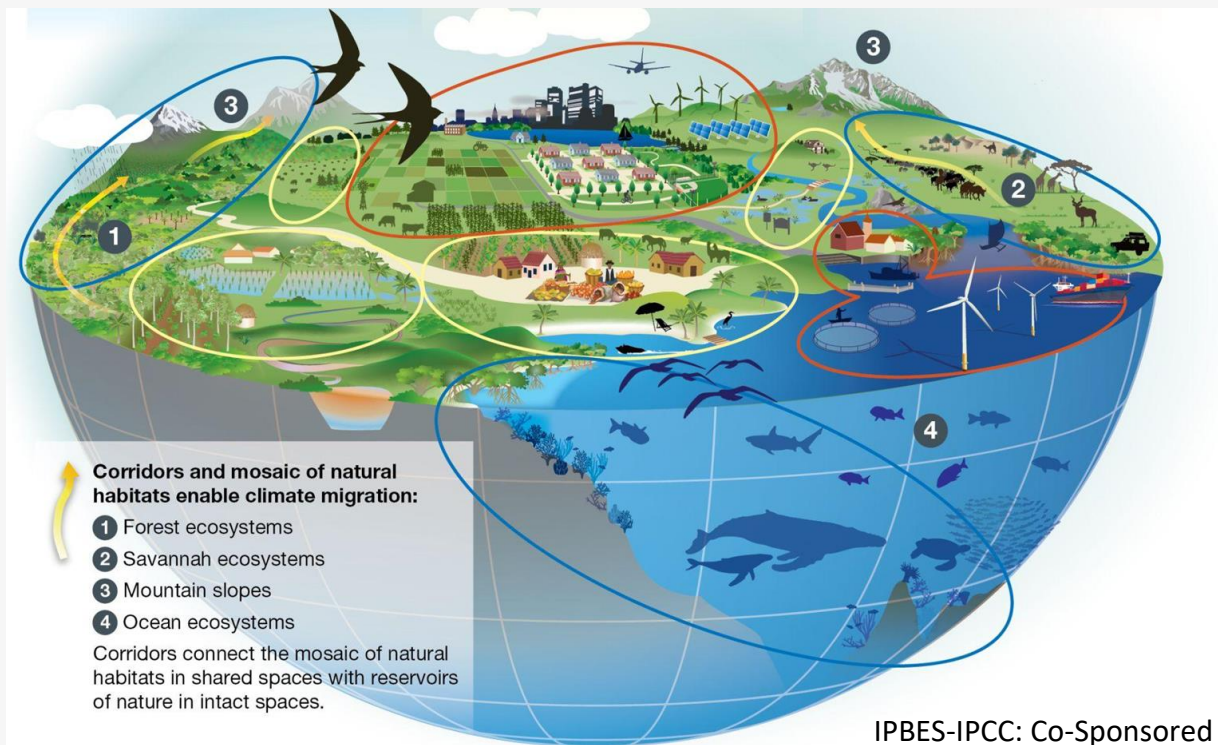
Implementing solutions while keeping to 1.5°C warming

Closing the mitigation gap as well as the adaptation gap across ocean (and land) systems, supported by spatial planning, combined with ...

- ...strengthening the biosphere for biodiversity and carbon storage, together with strengthening human resilience
- ...developing and implementing mosaic 'scapes for marine / freshwater / terrestrial and urban systems
- ...optimized neighbouring of protected, shared and heavily used spaces with species migration corridors
- ...considering the spatial needs of species and ecosystems for self-sustained biodiversity, species compositions, ecosystem services



Integrating conservation, climate and societal actions for Climate Resilient Development



Setting up mosaic land-, sea- and freshwater-scapes for effective and equitable conservation and restoration of approximately 30-50% of land, freshwater and ocean ecosystems can help ensure a healthy planet

Increasing urgency

Reaching sustainability and climate resilient development for ecosystems and people

SETTING THE PACE for system transitions

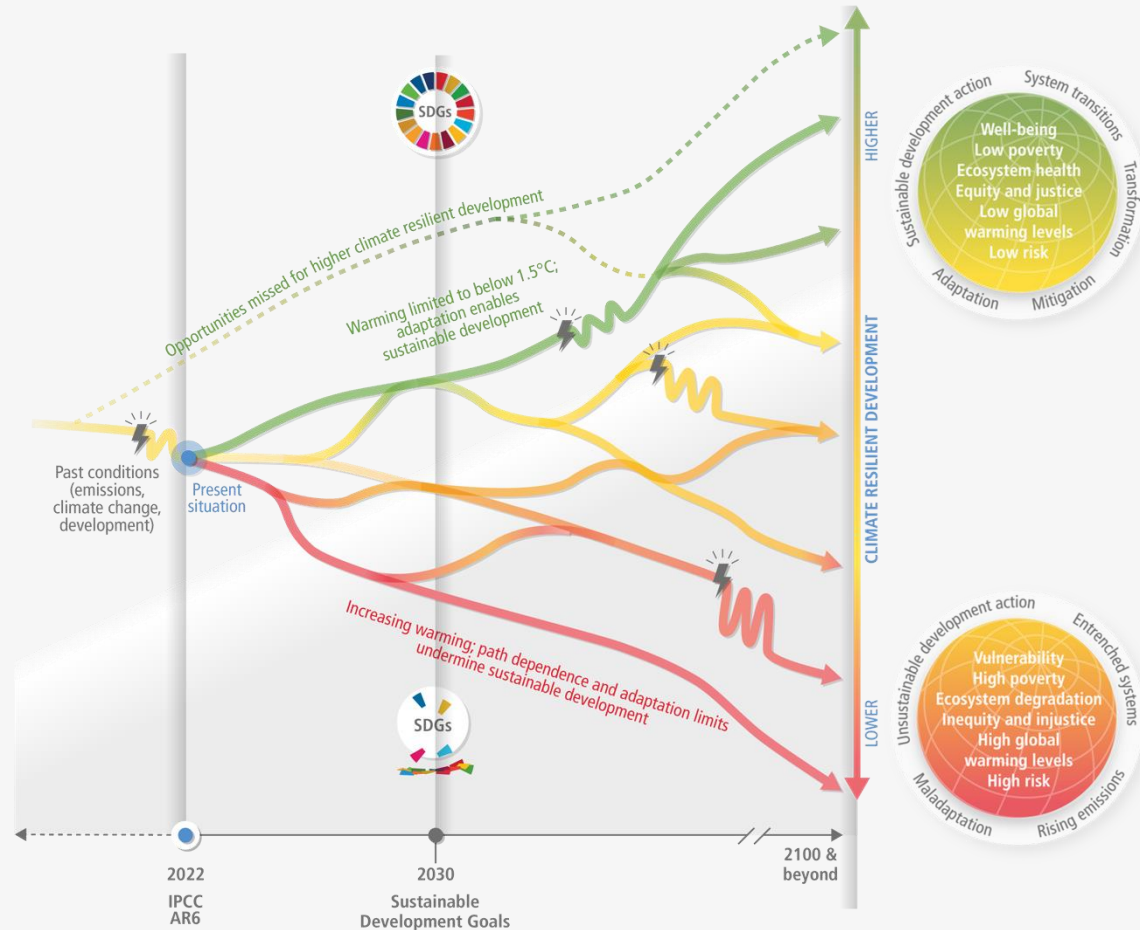
Monitoring progress

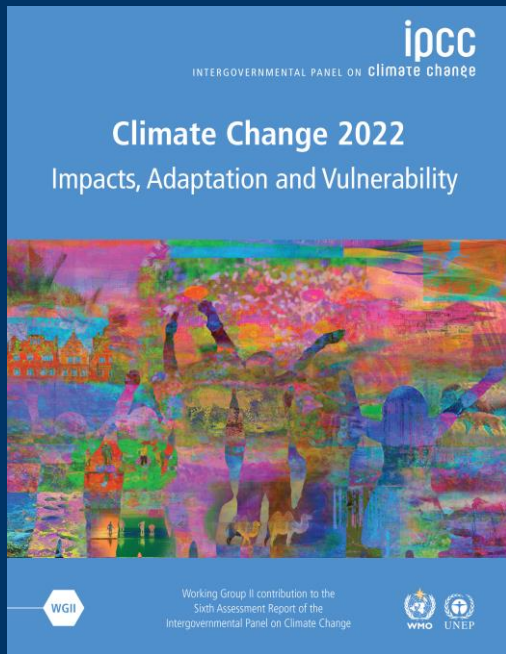


Illustrative climatic or non-climatic shock, e.g. COVID-19, drought or floods, that disrupts the development pathway



Narrowing window of opportunity for higher CRD





The science is clear for ocean, land and human society:

Any further delay in concerted global action will miss a brief and rapidly closing window to secure a liveable future.

This report offers solutions to the world. It is over to you now!



THANK YOU

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