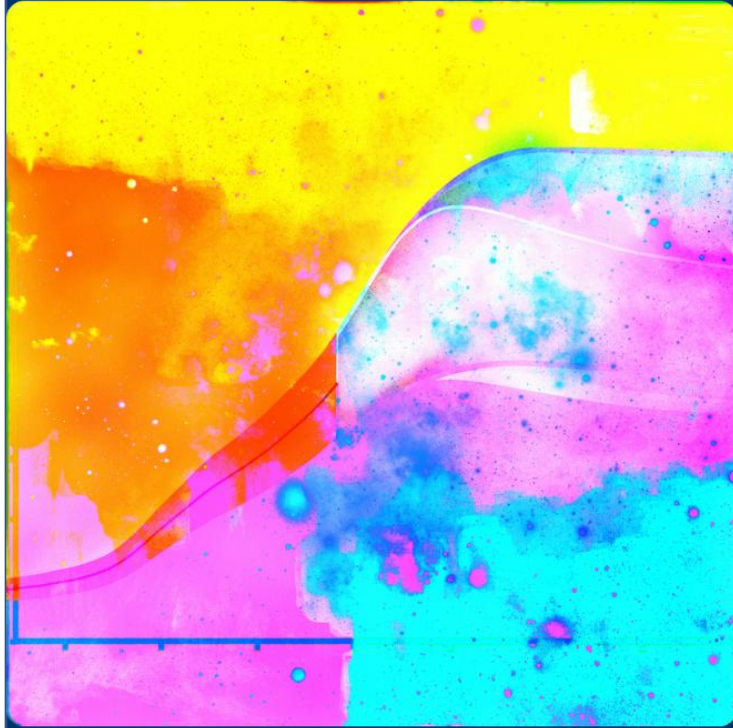


Climate Risks at 1.5°C and 2°C

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IPCC Special Report on Global Warming of 1.5°C

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Chapter 3 Impacts of 1.5°C Warming on Human and Natural Systems: CLAs and LAs

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Key messages

- **Climate change is already affecting people, ecosystems and livelihoods all around the world**
- **There are clear benefits to limiting global warming to 1.5°C compared to 2°C, or higher. Every bit of warming matters.**



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Less extreme weather at 1.5°C than at 2°C including extreme heat & rainfall

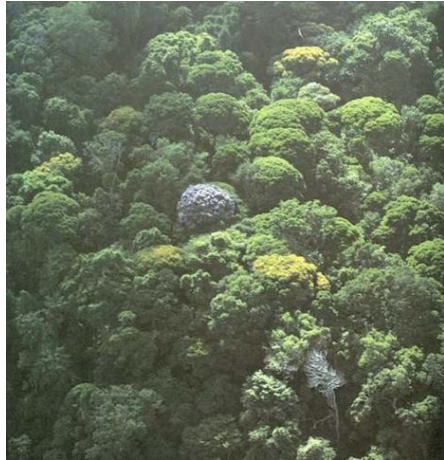
- Mid-latitude extreme hot days 3°C warmer at 1.5°C vs 4°C warmer at 2°C
- Risks from drought and precipitation deficit lower in some regions
- Risks from heavy precipitation lower in E Asia, N America, N H high latitude regions
- Fraction of global land area affected by flood hazard lower at 1.5°C than 2°C



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Impacts of global warming 1.5°C: sea level rise

- By 2100, sea level rise 0.26-0.77m for warming 1.5°C relative to 1986-2005
- By 2100, global mean sea level rise around 10 cm higher for 2°C warming but may continue to rise for centuries
- 10 million fewer people exposed to risk of rising seas (2010 population)
- Slower rate of SLR : greater opportunities for adaptation: restoring natural coastal ecosystems, infrastructure reinforcement



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Lower risks to natural and human systems at 1.5°C compared to 2°C

- Limiting warming to 1.5°C compared to 2°C lowers risks to terrestrial, freshwater and coastal ecosystems retaining more of their services to humans
- Climate-related risks to health, livelihoods, food security, water supply, human security increase with 1.5°C warming and further with 2°C warming



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Lower impacts in Arctic and marine ecosystems

- At 1.5°C Arctic summer sea ice persists for 99 in 100 years. At 2°C one in every 10 summers ice free
- Thawing of 1.5-2.5 million km² permafrost avoided if warming limited to 1.5°C rather than 2°C
- At 1.5°C 70-90% decline in existing healthy coral reefs. At 2°C >99% decline



Lower impacts in terrestrial ecosystems at 1.5°C than at 2°C

- About 6.5% terrestrial land area projected to change from one biome to another at 1.5°C. At 2°C this rises to 13%.
- Range losses of 50% or more projected in around 6% insects, 8% plants and 4% vertebrates at 1.5°C. At 2°C this rises to around 18% insects, 16% plants and 8% vertebrates.
- Above 1.5°C: expansion of desert in the Mediterranean biome causing changes unparalleled in the last 10,000 years

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Lower impacts in human systems

Limiting warming to 1.5°C compared to 2°C:

- Could reduce the number of people both exposed to climate-related risks and susceptible to poverty by up to several hundred million by 2050
- Populations at higher risk include disadvantaged and vulnerable populations, some indigenous peoples, and local communities dependent on agricultural or coastal livelihoods

Impacts of global warming 1.5°C

At 1.5°C compared to 2°C:

- Smaller reductions in yields of maize, rice, wheat particularly in low latitude areas e.g. Sahel, Mediterranean, W/C Africa
- Global population exposed to increased water shortages is up to 50% less
- Climate change risk hotspots include
 - West Africa (crop yields)
 - Mekong (salinisation, flooding, livelihoods)



Jason



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Impacts of global warming 1.5/2°C

At 1.5°C compared to 2°C:

- Up to several hundred million fewer people exposed to climate-related risk and susceptible to poverty by 2050
- Lower risks from vector borne disease
- Lower risk to fisheries and the livelihoods that depend on them
- 7-10% loss of rangeland livestock globally by 2°C



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Adaptation

- Most adaptation needs will be lower for global warming of 1.5°C compared to 2°C
- Limits to adaptation and adaptive capacity for some human and natural systems at global warming of 1.5°C, with associated losses



Implications of ‘overshoot’

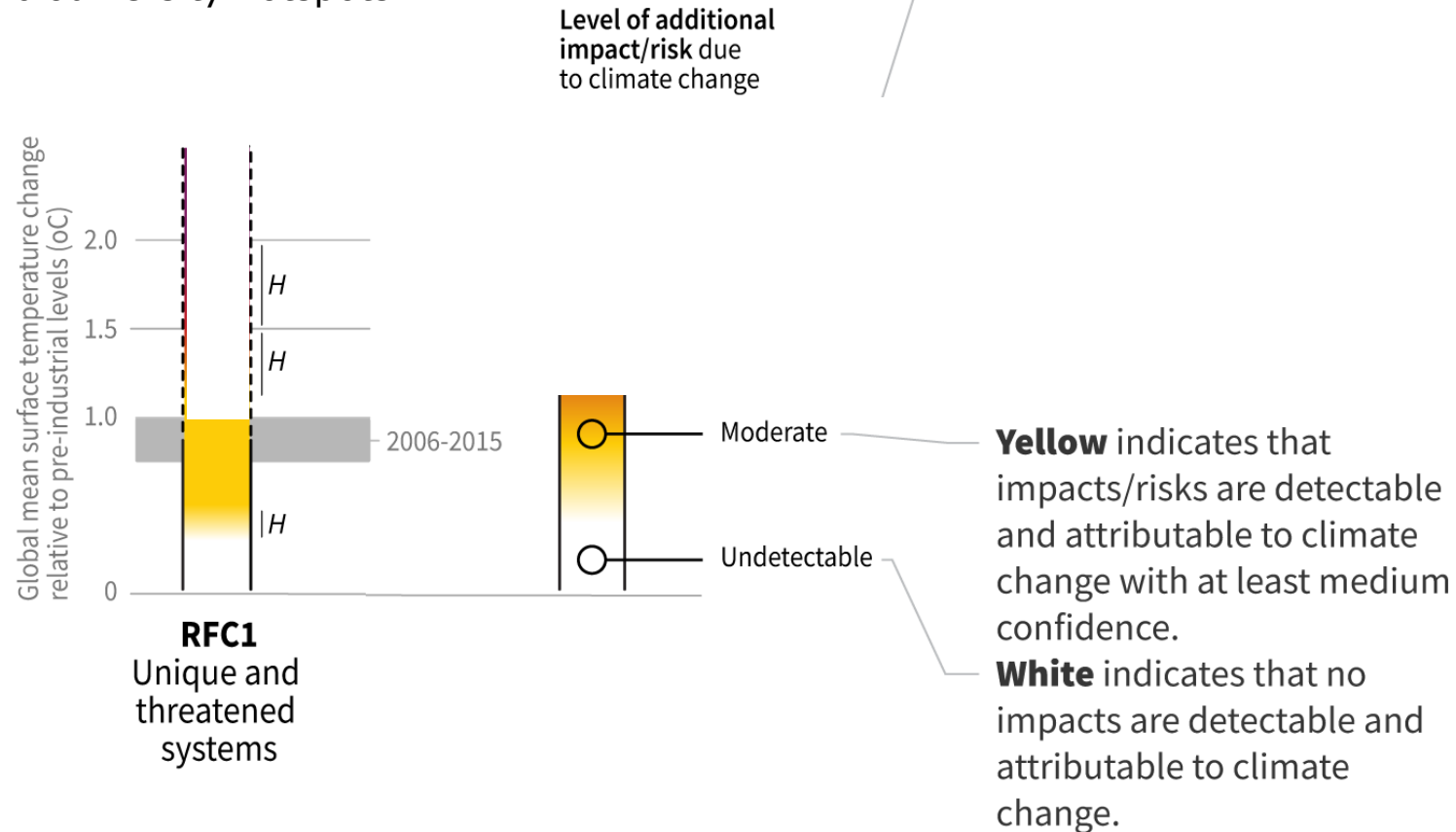
Future risks depend on the rate, peak and duration of warming:

- Larger if warming exceeds 1.5°C before returning to that level by 2100, than if warming gradually stabilizes at 1.5°C
- Some impacts may be irreversible, such as ecosystem loss

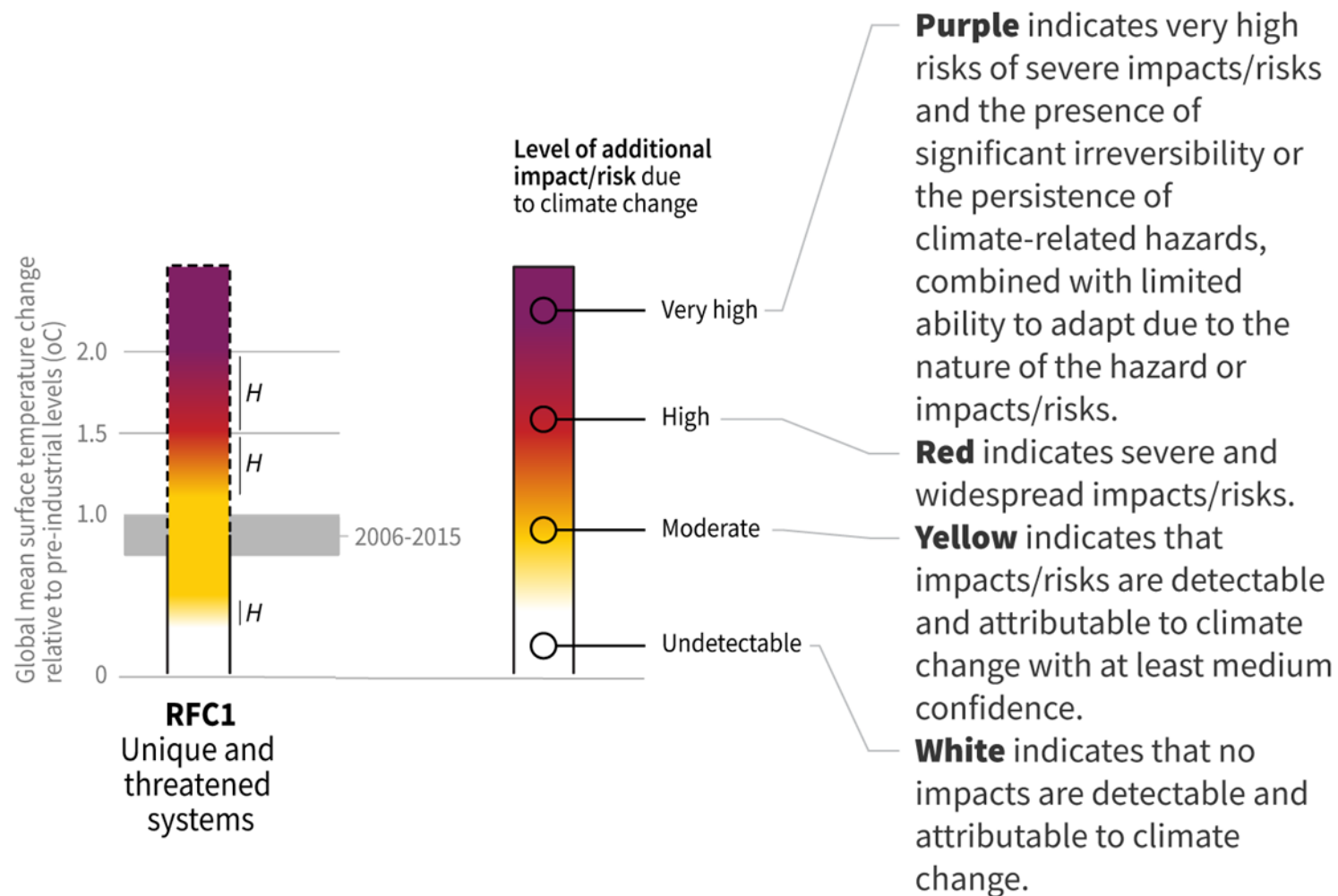
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Reasons for Concern : Example Unique and Threatened Systems

- **RFC1** Unique and threatened systems encompass ecological and human systems that (i) have restricted geographic ranges constrained by climate related conditions and (ii) have high endemism or other distinctive properties. They include coral reefs, the Arctic and its indigenous people, mountain glaciers, and biodiversity hotspots.



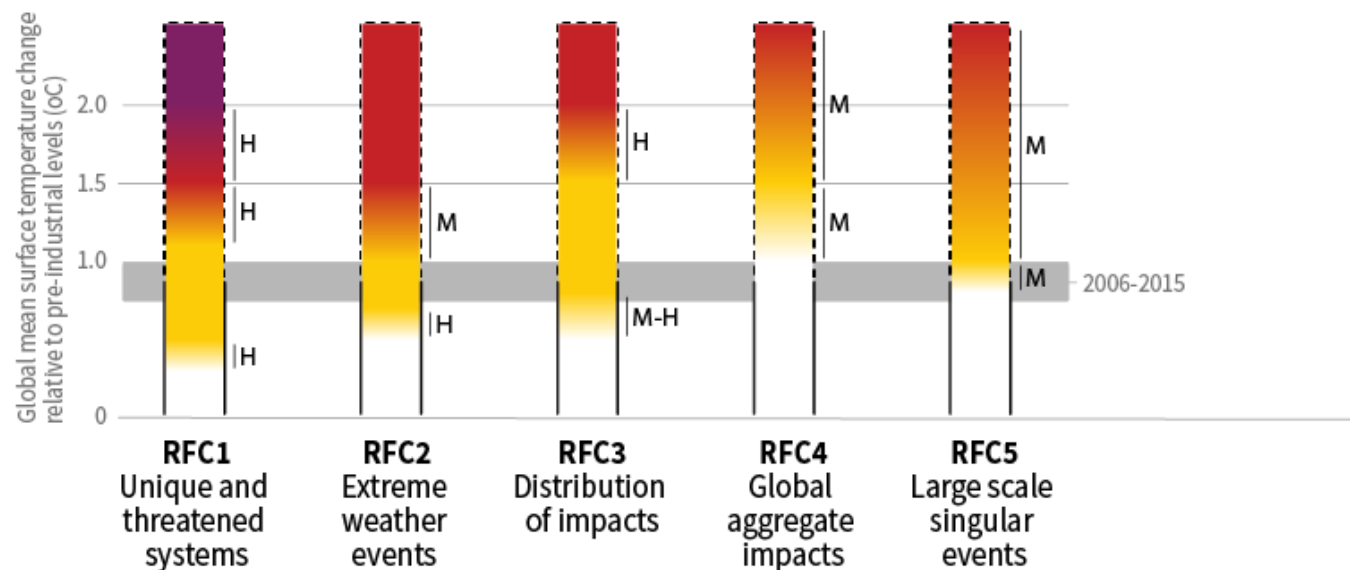
Reasons for Concern : Example Unique and Threatened Systems



SPM2

How the level of global warming affects impacts and/or risks associated with the Reasons for Concern (RFCs) and selected natural, managed and human systems

Impacts and risks associated with the Reasons for Concern (RFCs)

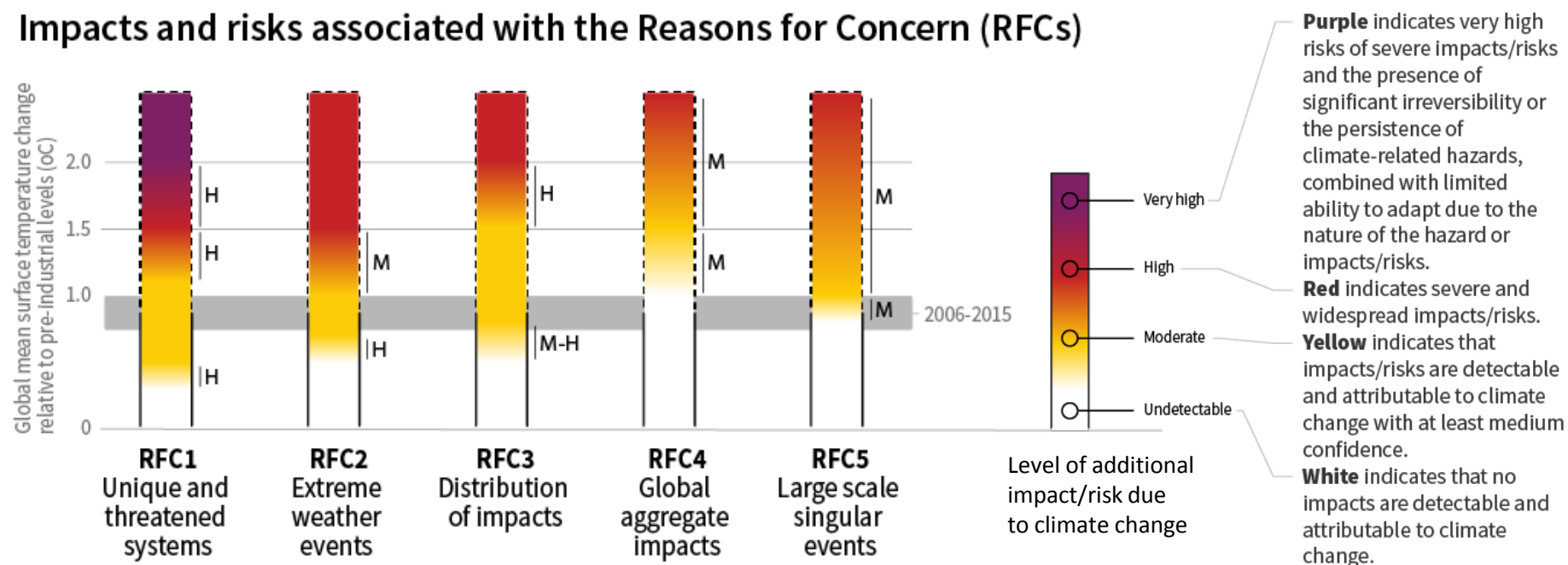


Confidence level for transition: L=Low, M=Medium, H=High and VH=Very high

SPM2

How the level of global warming affects impacts and/or risks associated with the Reasons for Concern (RFCs) and selected natural, managed and human systems

Impacts and risks associated with the Reasons for Concern (RFCs)



Confidence level for transition: L=Low, M=Medium, H=High and VH=Very high



Increased Concern

Assessed levels of risk have increased since AR5 for global warming of 2°C.

- Transition from high to very high risk between 1.5 and 2°C for RFC1 (Unique and threatened systems)
- Transition from moderate to high risk between 1°C and 2°C for RFC3 (Distribution of impacts)

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Increased Concern

Assessed levels of risk have increased since AR5 for global warming of 2°C.

- Transition from moderate to high risk between 1°C and 2.5°C for RFC5 (Large scale singular events)
- Instabilities in Greenland & W. Antarctic ice sheets may trigger under 1.5 to 2C warming (medium confidence)



Lower impacts on the economy

At 1.5°C compared to 2°C:

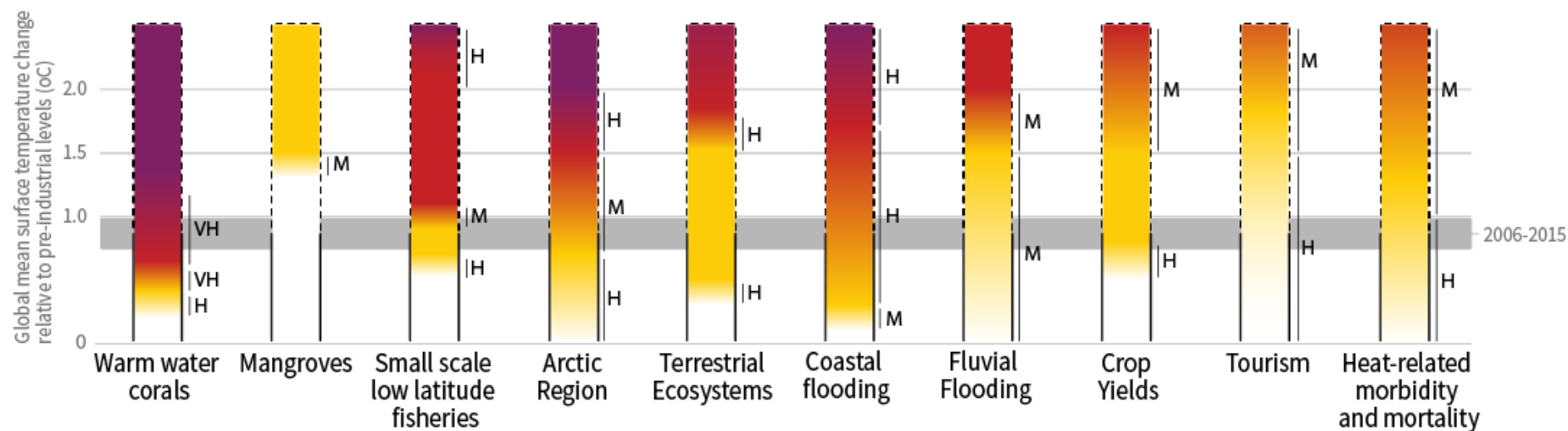
- Risks to global economic growth are lower
- Countries in the tropics and S Hemisphere subtropics expected to experience largest impacts on economic growth

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SPM2

How the level of global warming affects impacts and/or risks associated with the Reasons for Concern (RFCs) and selected natural, managed and human systems

Impacts and risks for selected natural, managed and human systems



Confidence level for transition: L=Low, M=Medium, H=High and VH=Very high



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Key messages

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**Thank you for your
attention!**

