Mainstreaming climate information: especially for adaptation

Chair: Martin Parry.

Speakers: Tom Downing , Laban Ogallo, Atiq Rahman.

Discussants: Amadou Gaye, Jurgen Lefevre, Anand Patwardhan, Tara Shine.

Mainstreaming climate information for adaptation: An introduction to the issues.

Martin Parry

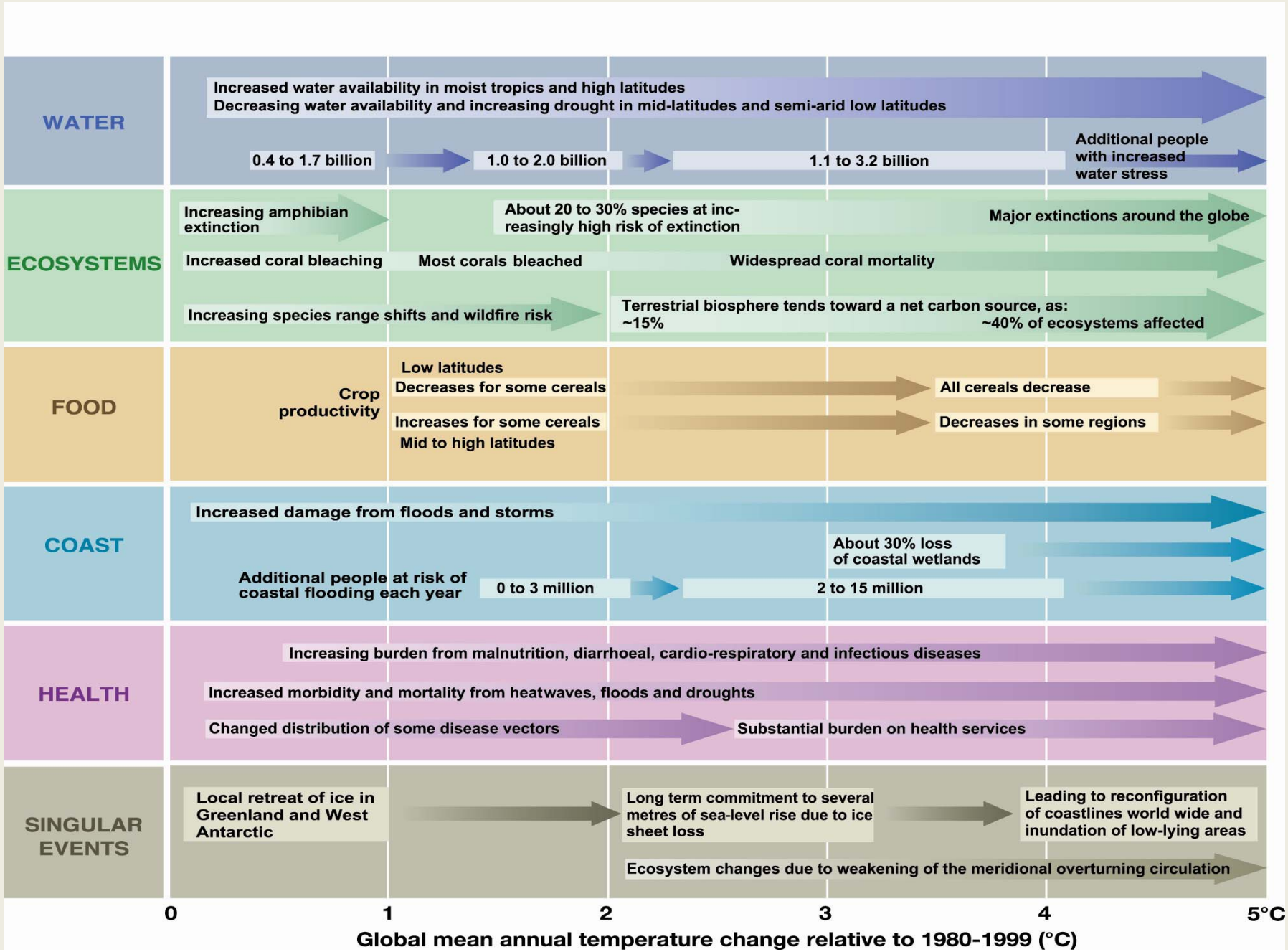
Imperial College London

martin@mlparry.com

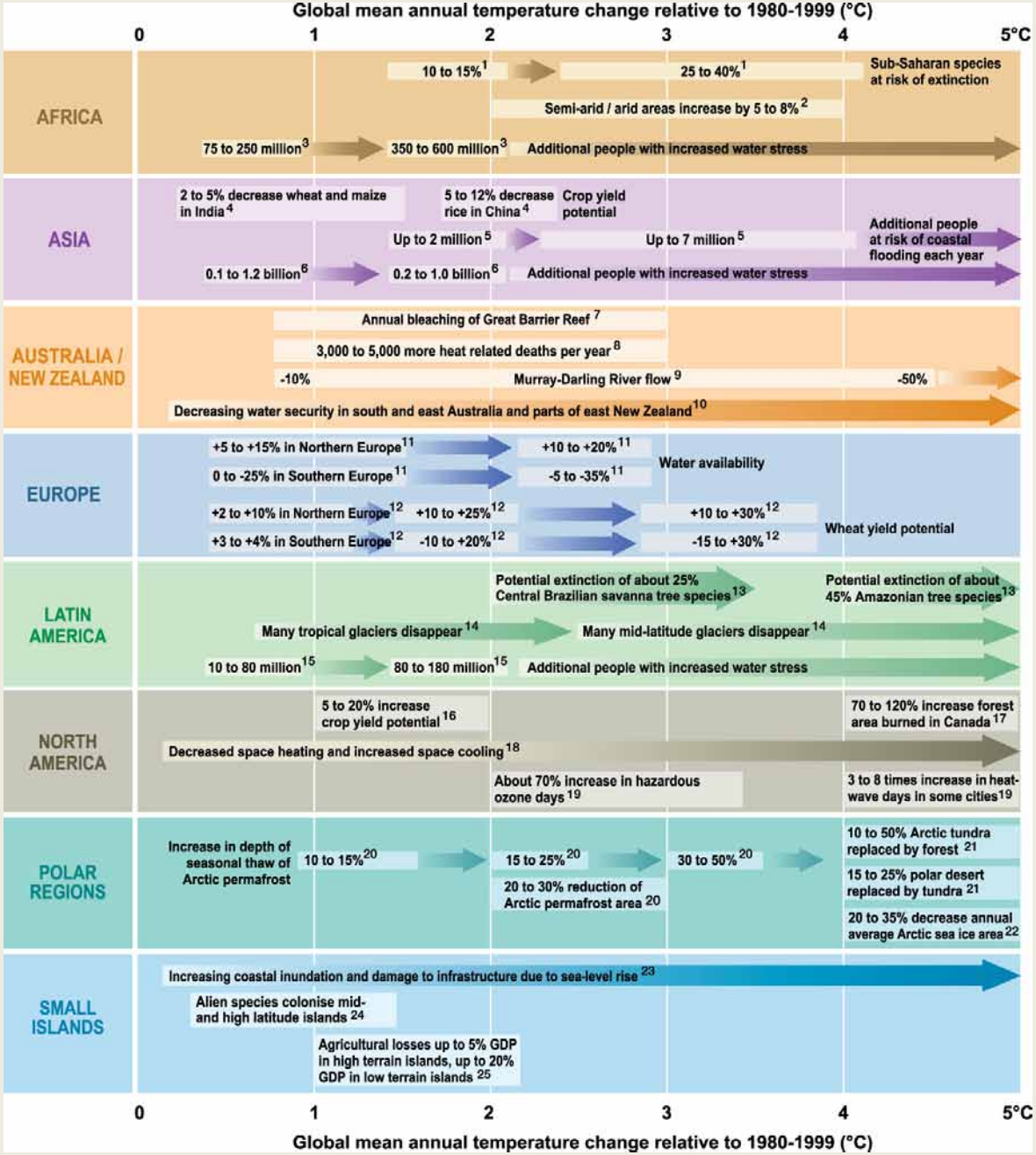
Content

- What kinds of impacts will we need to adapt to?
- Where will adaptation be most needed, and how much?
- How can the adaptation challenge can be reduced by mitigation (emissions reduction)
- How much will adaptation ‘cost’?

The timing of impacts by sector (IPCC WGII TS 2007)



Impacts by region (IPCC WG2 Tech Summary 2007)

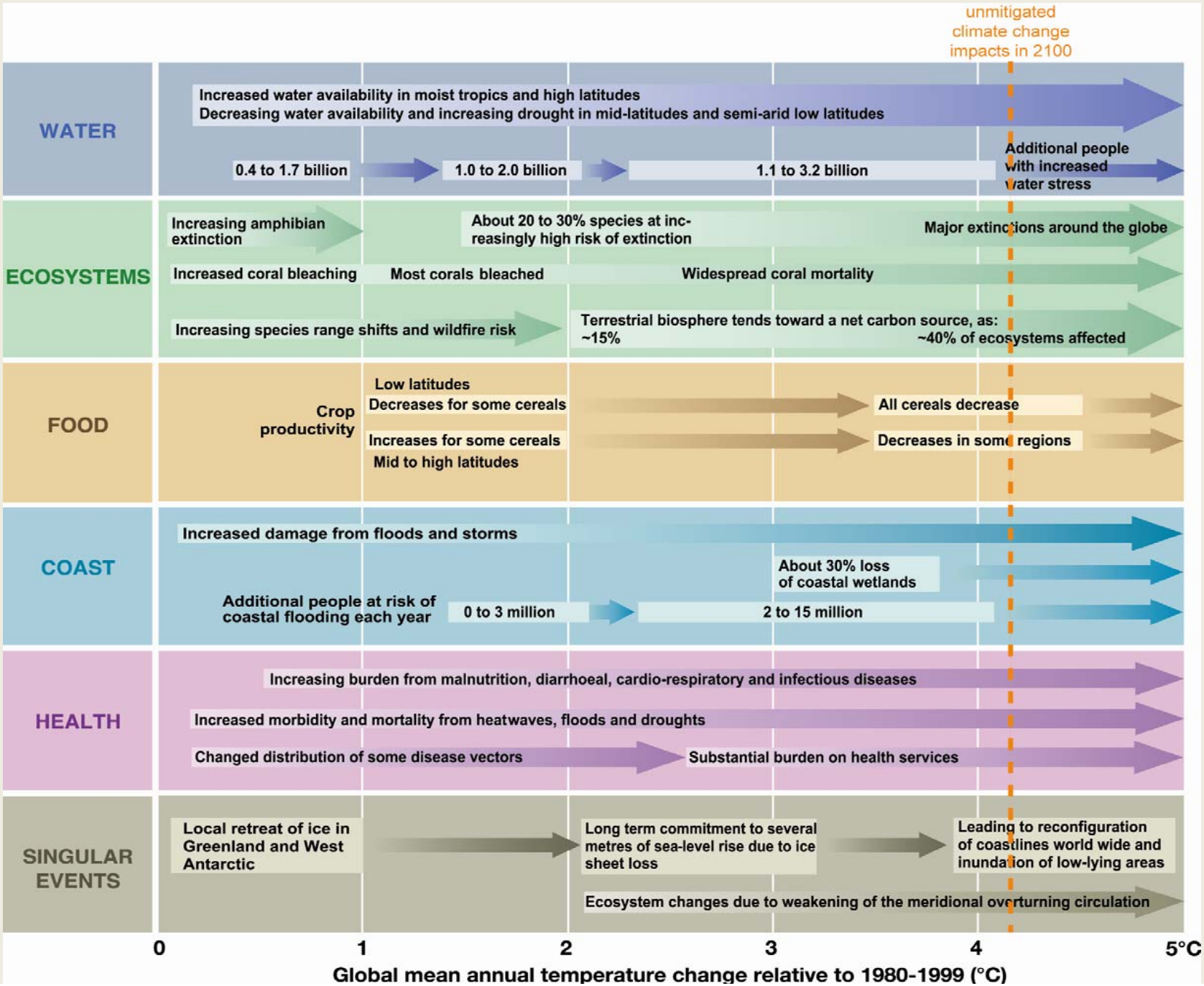


The most vulnerable people and places

(IPCC, WGII 2007)

- **Most vulnerable regions** are:
  - Africa, Asian mega-deltas, small islands, the Arctic
- **Most vulnerable sectors** are:
  - water in the dry tropics
  - agriculture in low latitudes
  - human health in poor areas
  - ecosystems at the margins: e.g. tundra, boreal, mountains or already stressed: e.g. mangroves, coral

In all countries, even those with high incomes, some are especially at risk: **the poor, young children, the elderly**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Increased water availability in moist tropics and high latitudes
Decreasing water availability and increasing drought in mid-latitudes and semi-arid low latitudes
0.4 to 1.7 billion
1.0 to 2.0 billion
1.1 to 3.2 billion
Additional people with increased water stress
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Increasing amphibian extinction
About 20 to 30% species at increasingly high risk of extinction
Major extinctions around the globe
Increased coral bleaching
Most corals bleached
Widespread coral mortality
Increasing species range shifts and wildfire risk
Terrestrial biosphere tends toward a net carbon source, as:
~15%
~40% of ecosystems affected
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Crop productivity
Low latitudes
Decreases for some cereals
All cereals decrease
Increases for some cereals
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Mid to high latitudes
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Increased damage from floods and storms
About 30% loss of coastal wetlands
Additional people at risk of coastal flooding each year
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Increasing burden from malnutrition, diarrhoeal, cardio-respiratory and infectious diseases
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Changed distribution of some disease vectors
Substantial burden on health services
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Leading to reconfiguration of coastlines world wide and inundation of low-lying areas
Ecosystem changes due to weakening of the meridional overturning circulation
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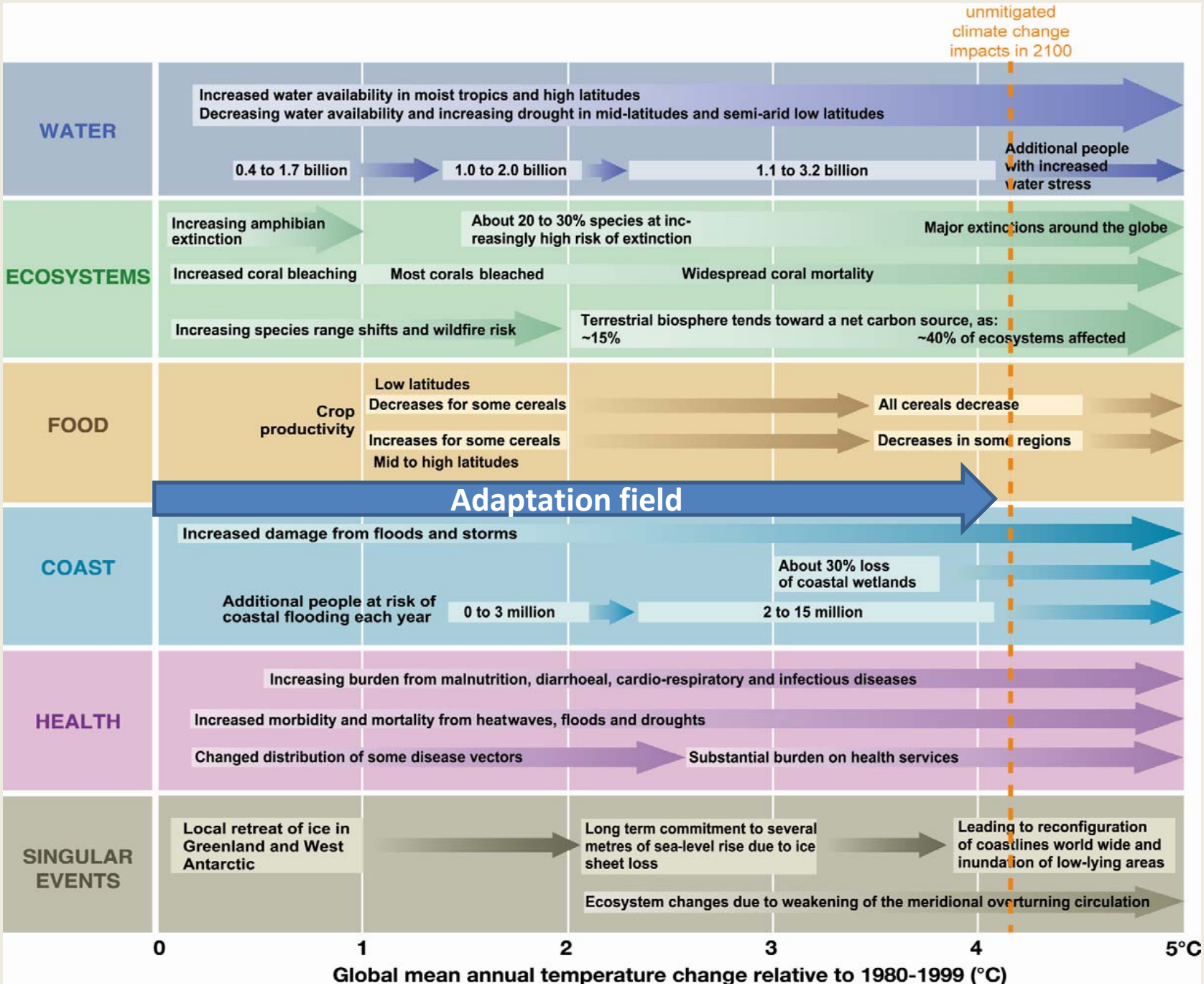
Global mean annual temperature change relative to 1980-1999 (°C)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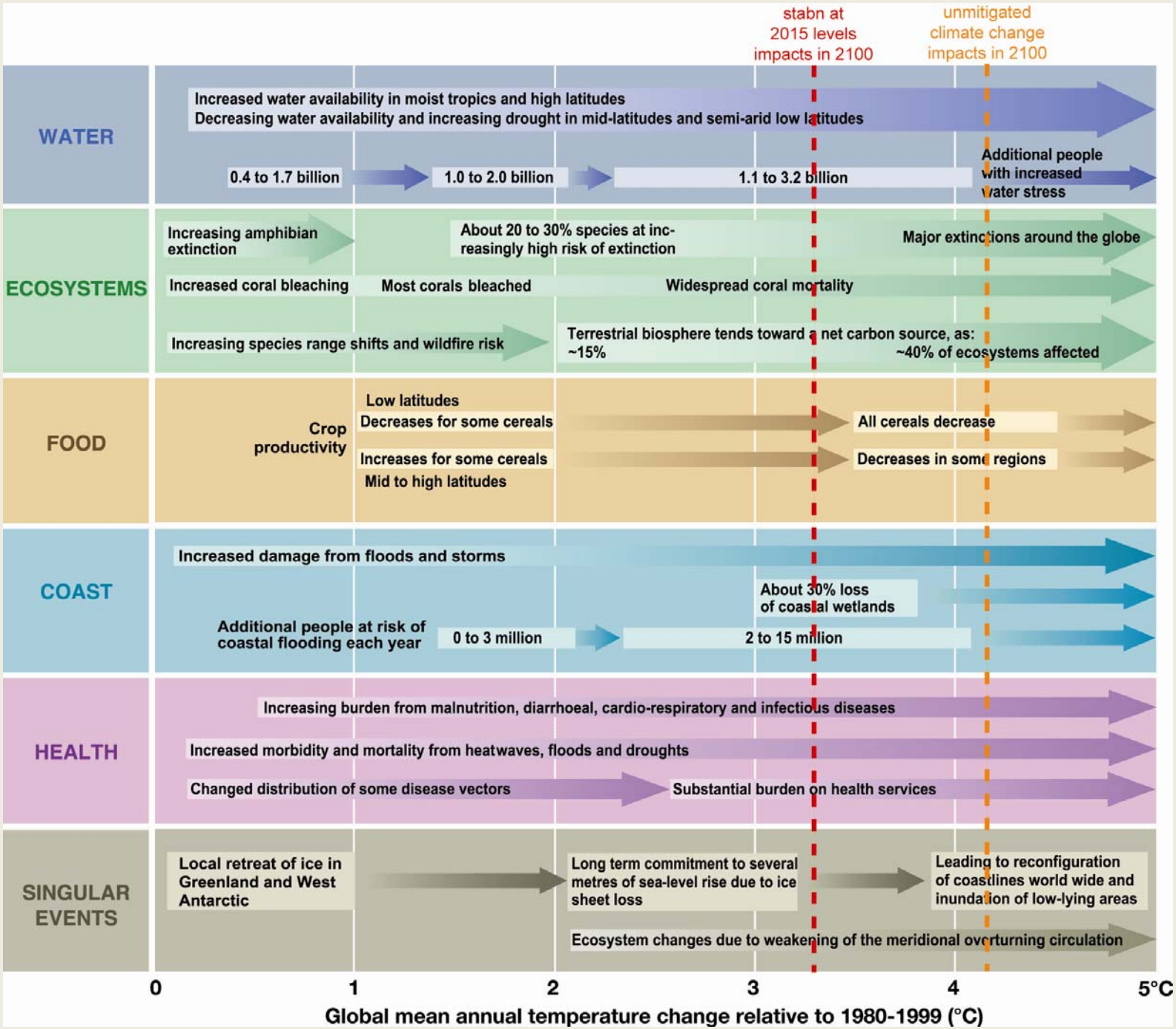
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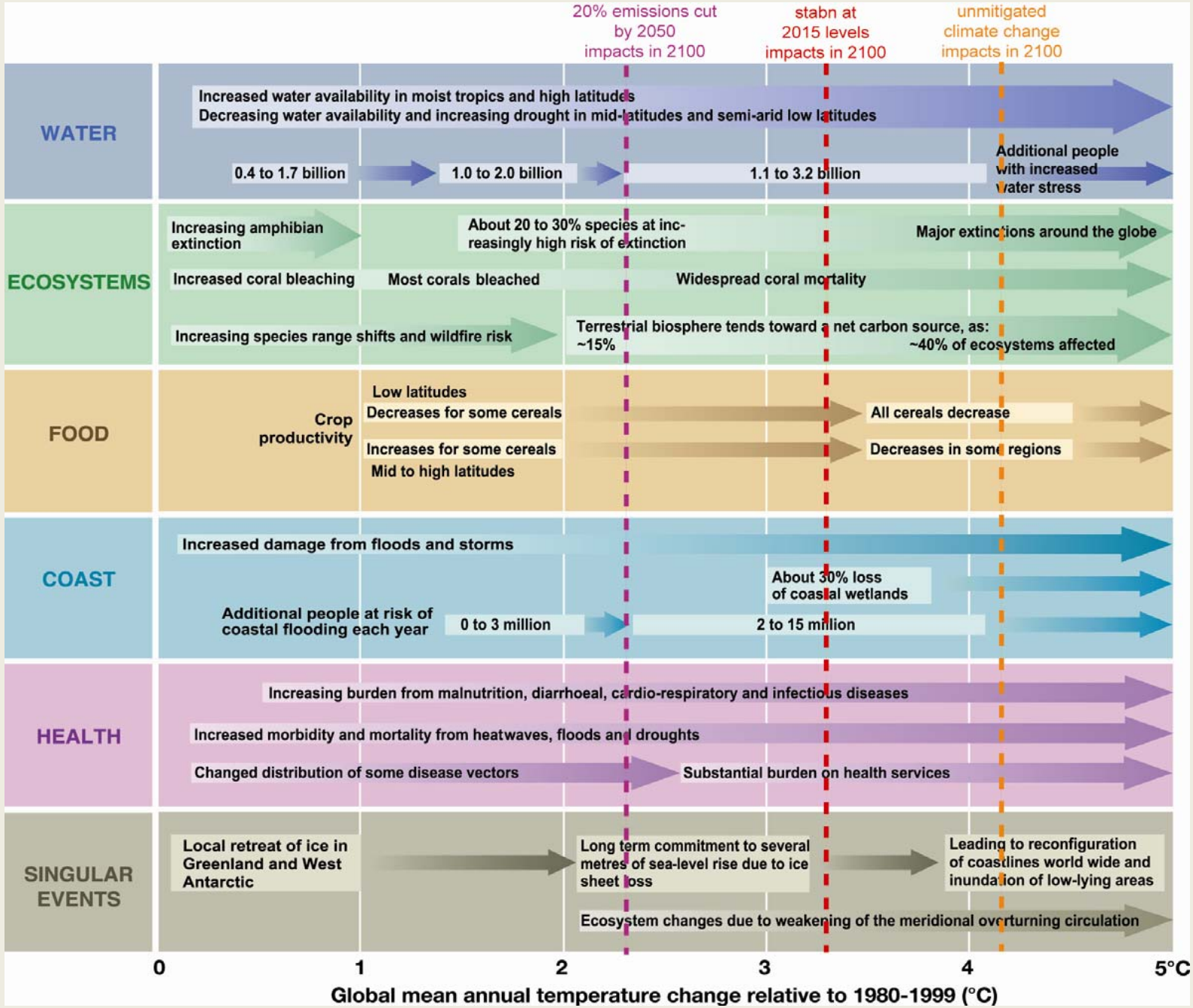
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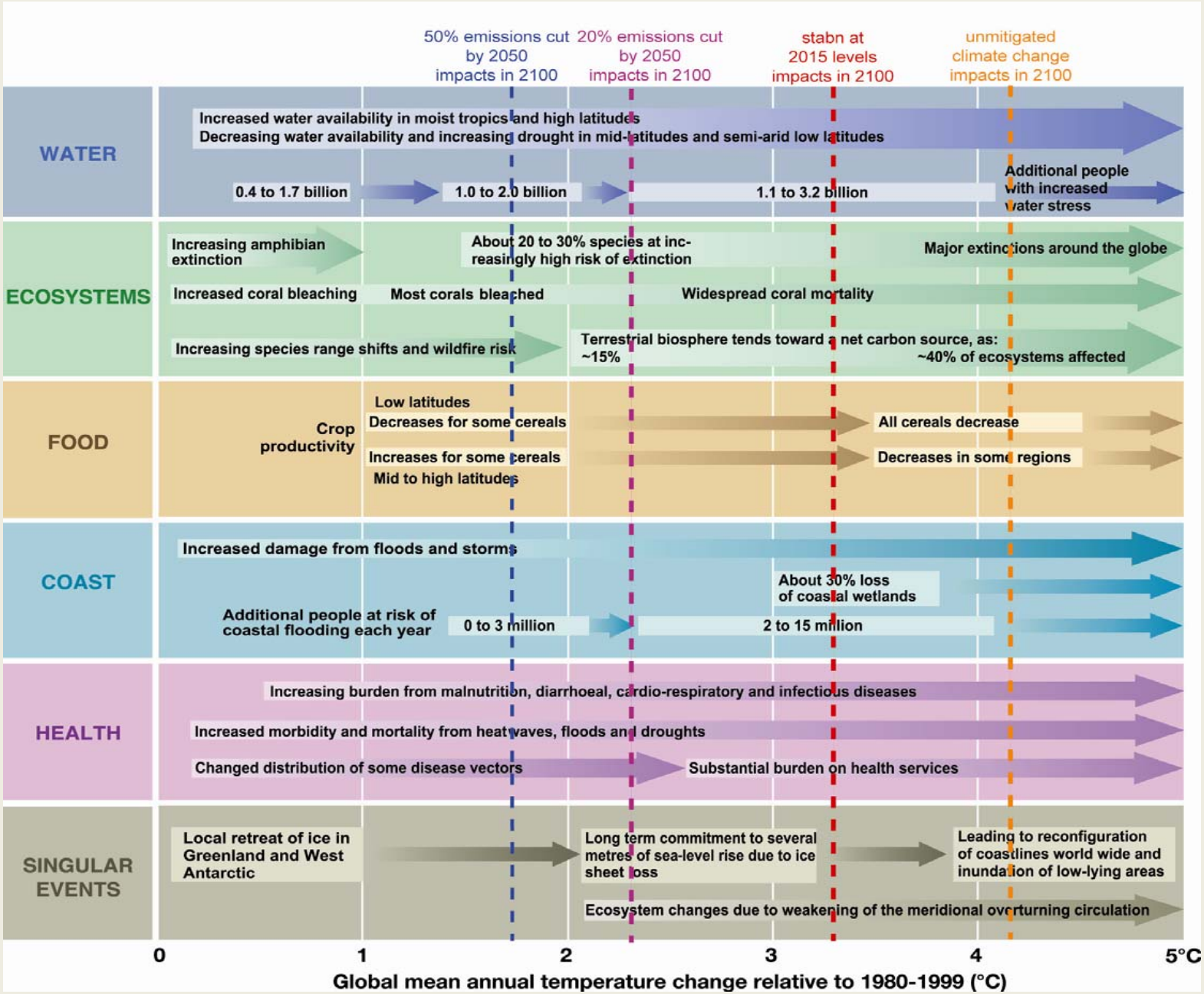
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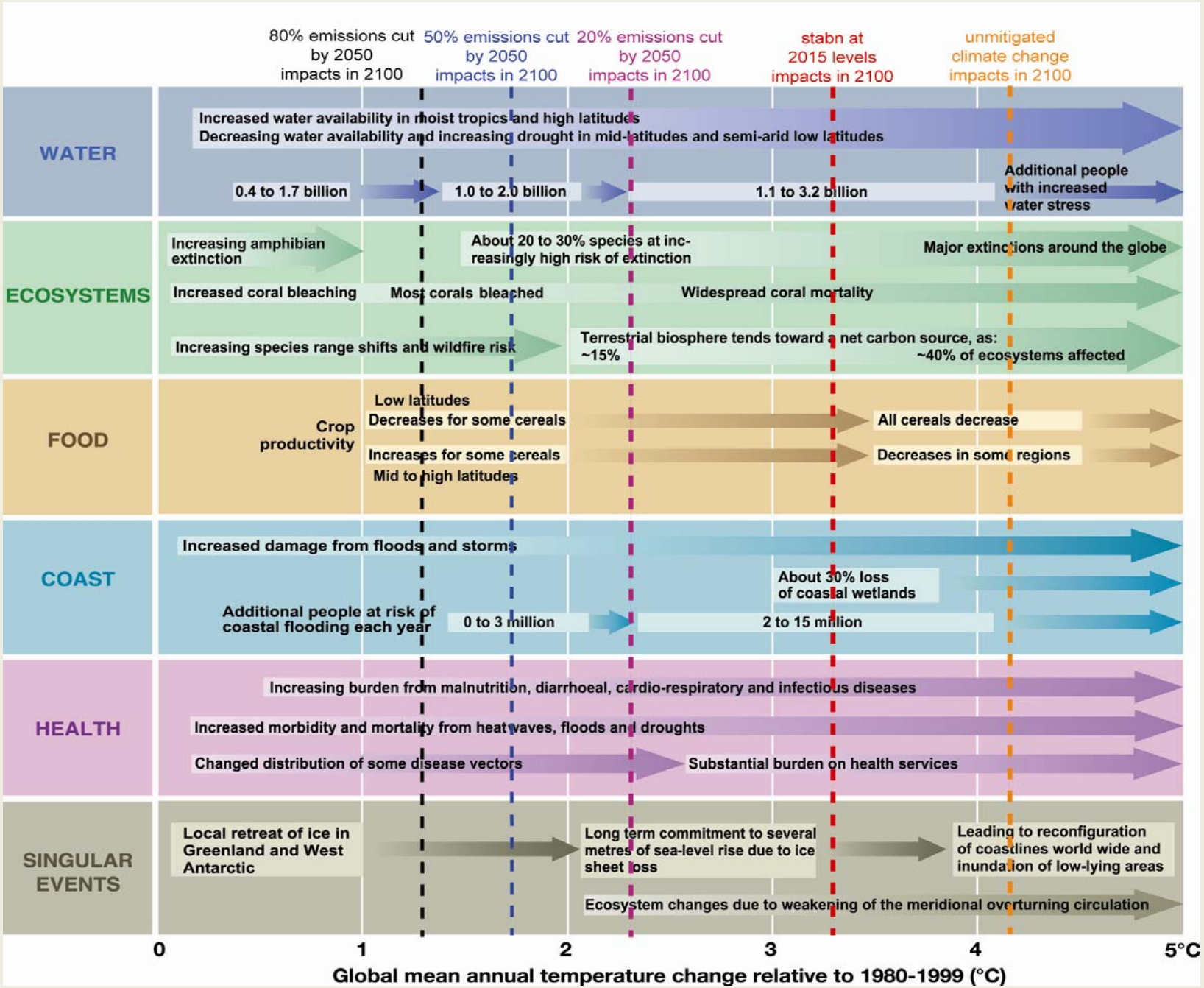
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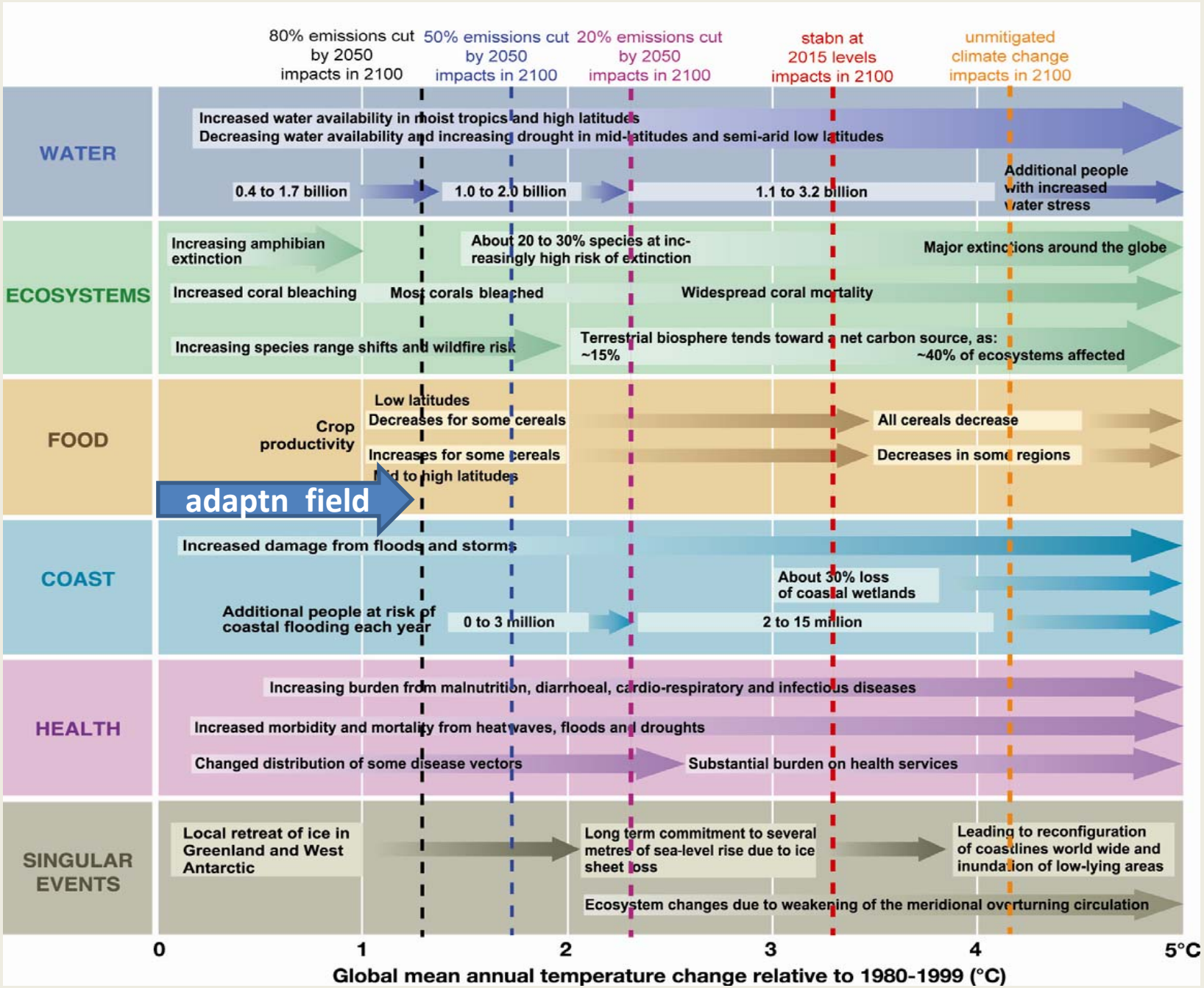
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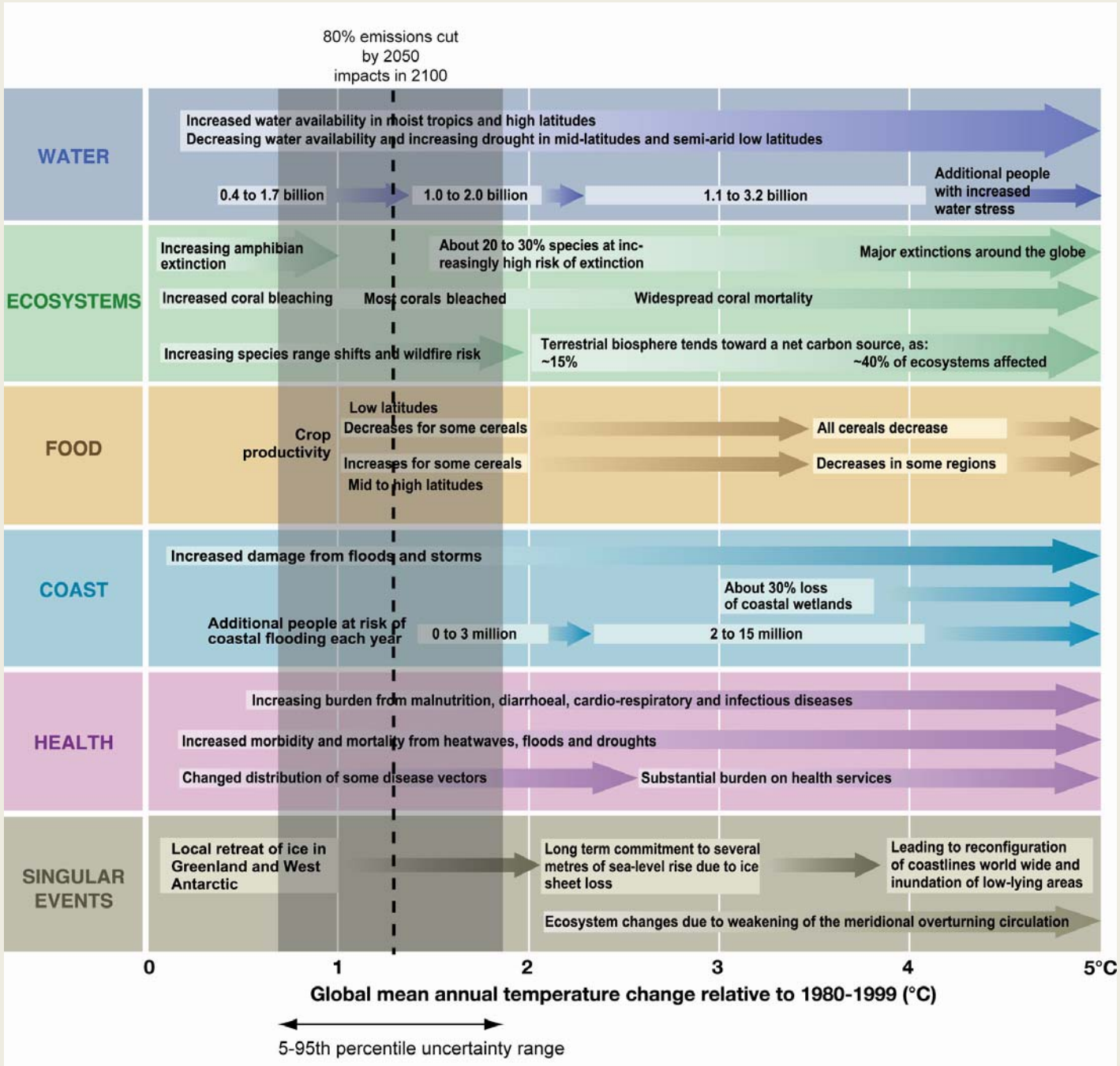
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5-95th percentile uncertainty range

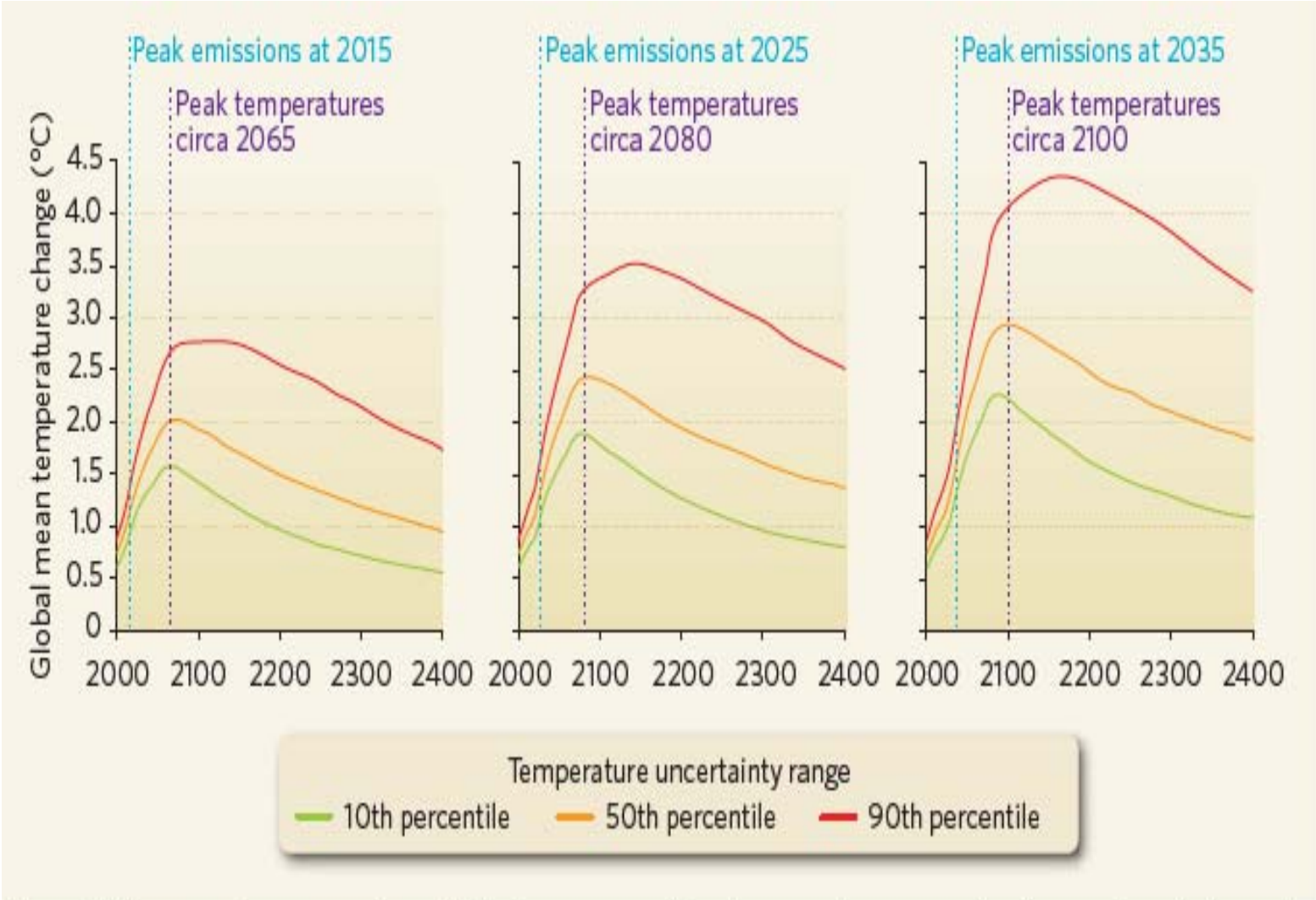
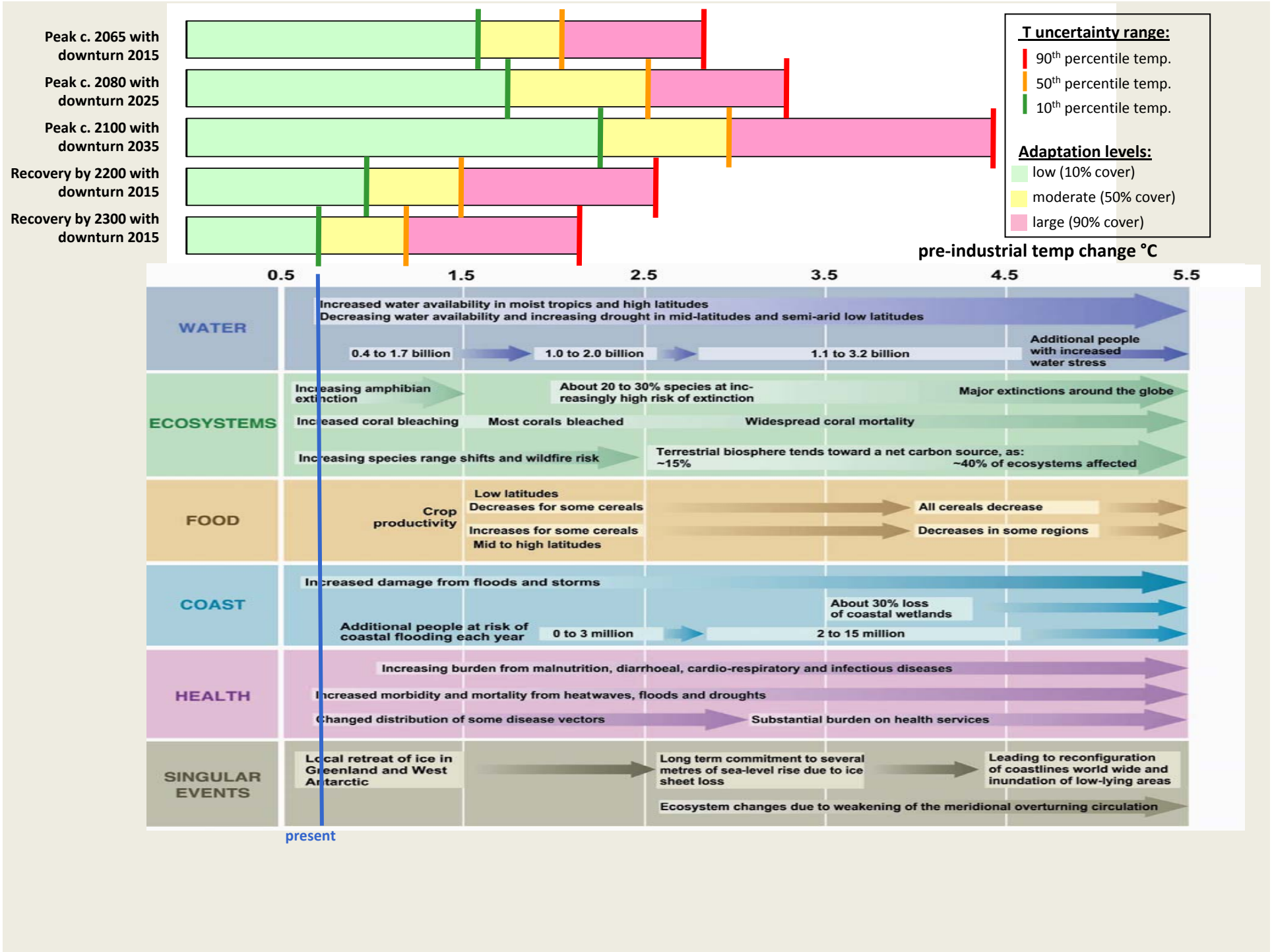


Figure 1 | Temperature scenarios. Global average surface temperature scenarios for peak emissions at three different dates (2015, 2025 and 2035) with 3%-per-year reductions in greenhouse-gas emissions.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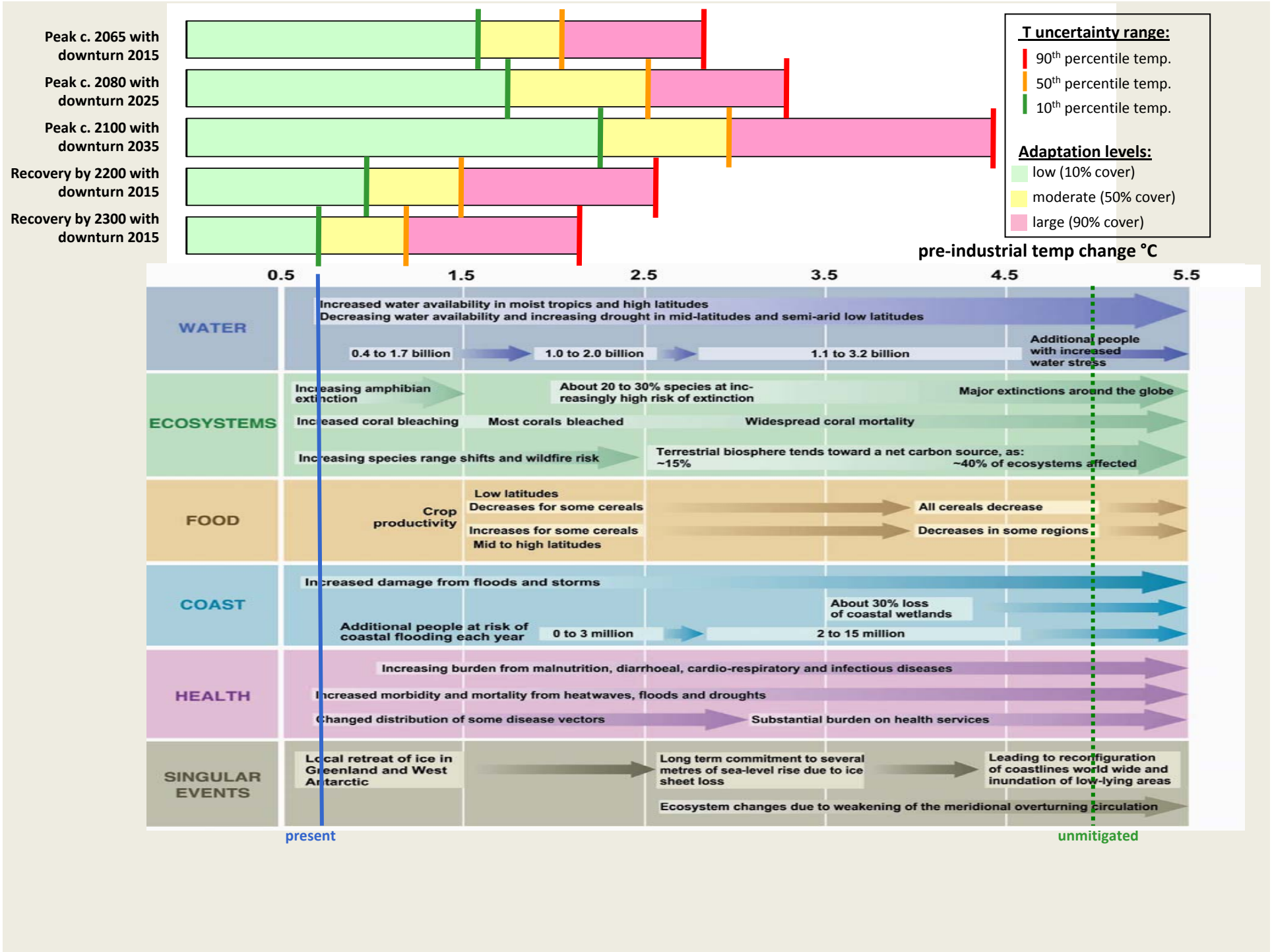
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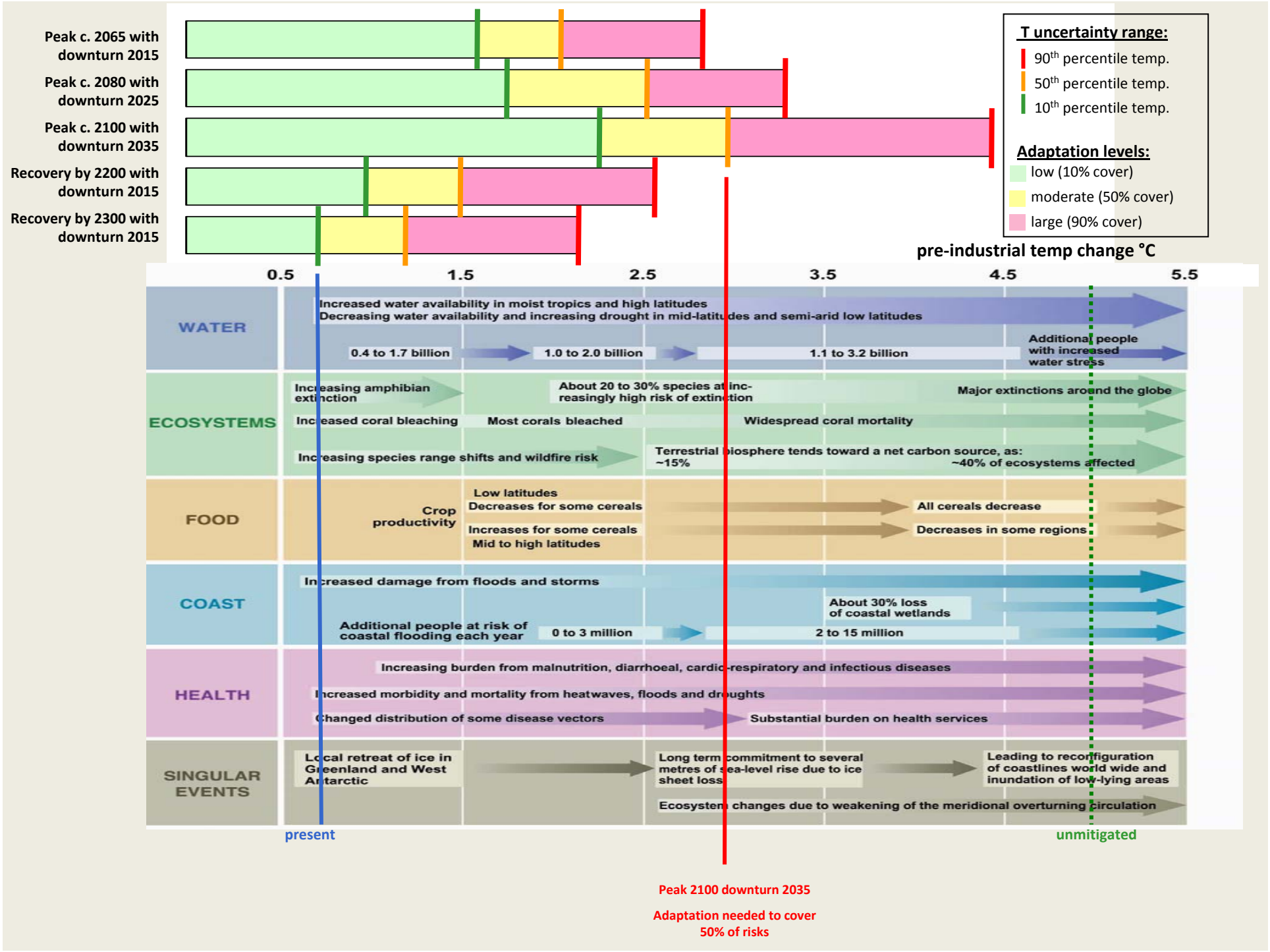
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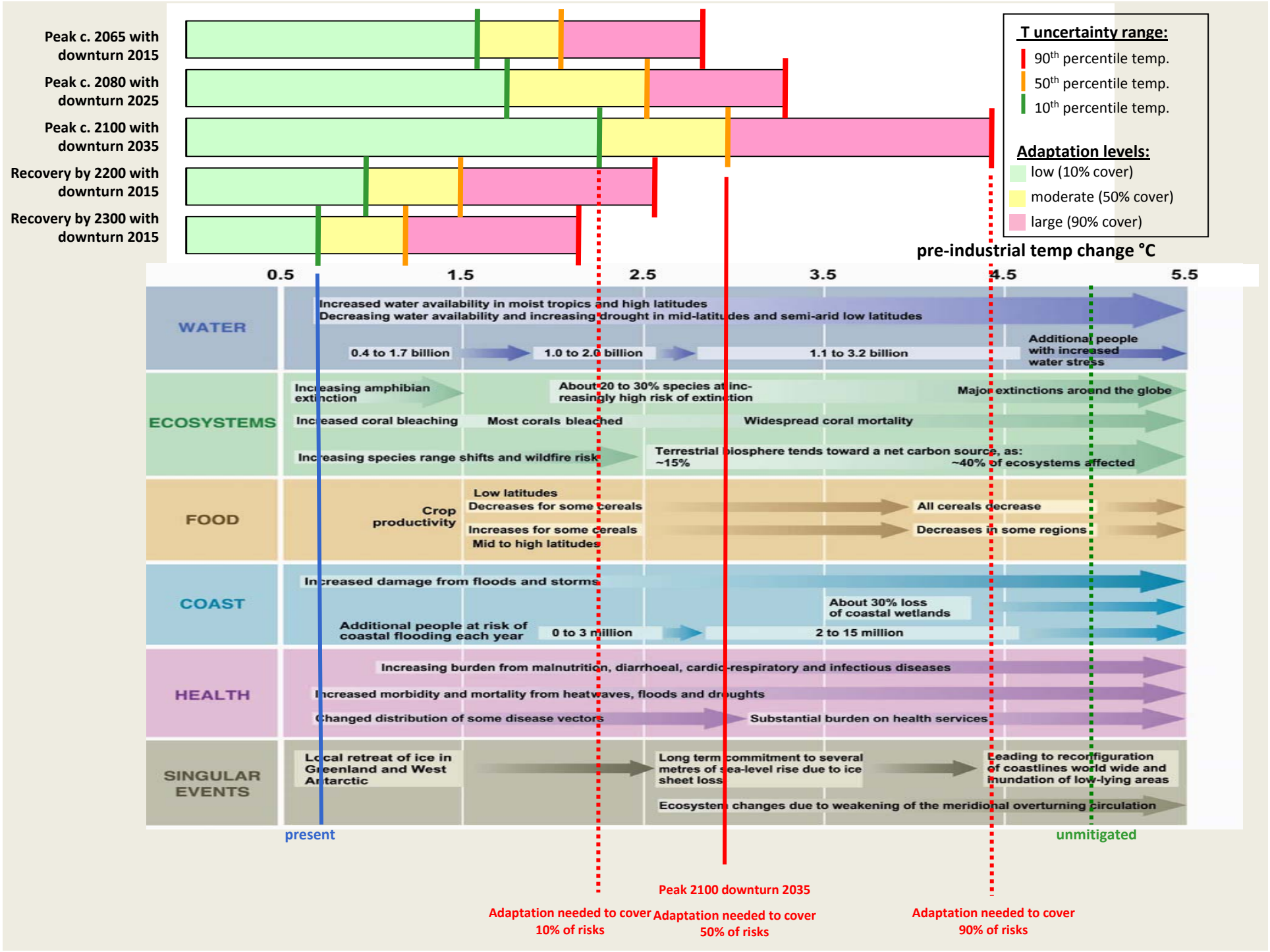
Adaptation needed to cover 50% of risks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Increases for some cereals
Decreases in some regions
Mid to high latitudes
COAST
Increased damage from floods and storms
About 30% loss of coastal wetlands
Additional people at risk of coastal flooding each year
0 to 3 million
2 to 15 million
HEALTH
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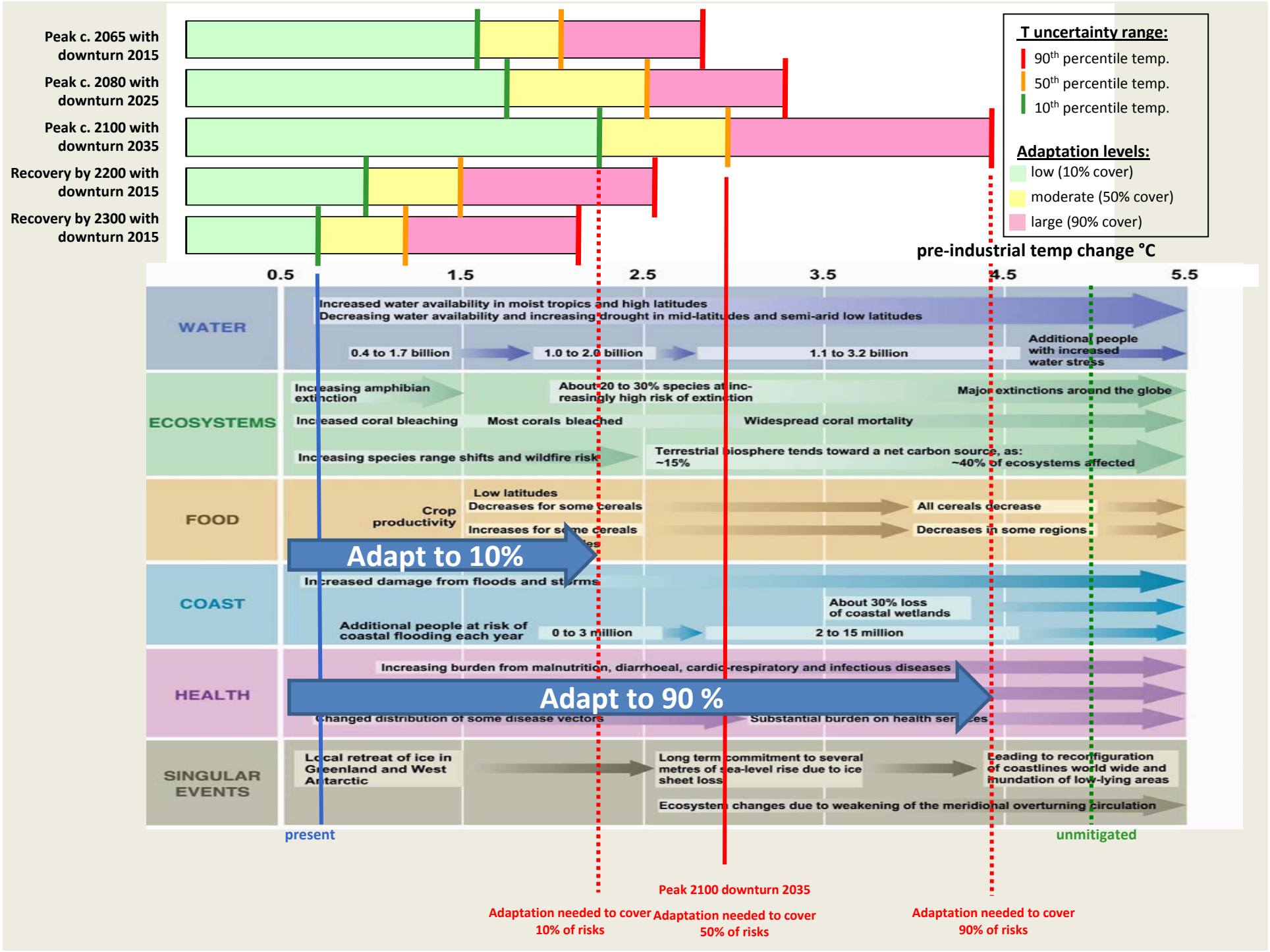
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1.5
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0.4 to 1.7 billion
1.0 to 2.0 billion
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Additional people with increased water stress
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About 20 to 30% species at increasingly high risk of extinction
Major extinctions around the globe
Increased coral bleaching
Most corals bleached
Widespread coral mortality
Increasing species range shifts and wildfire risk
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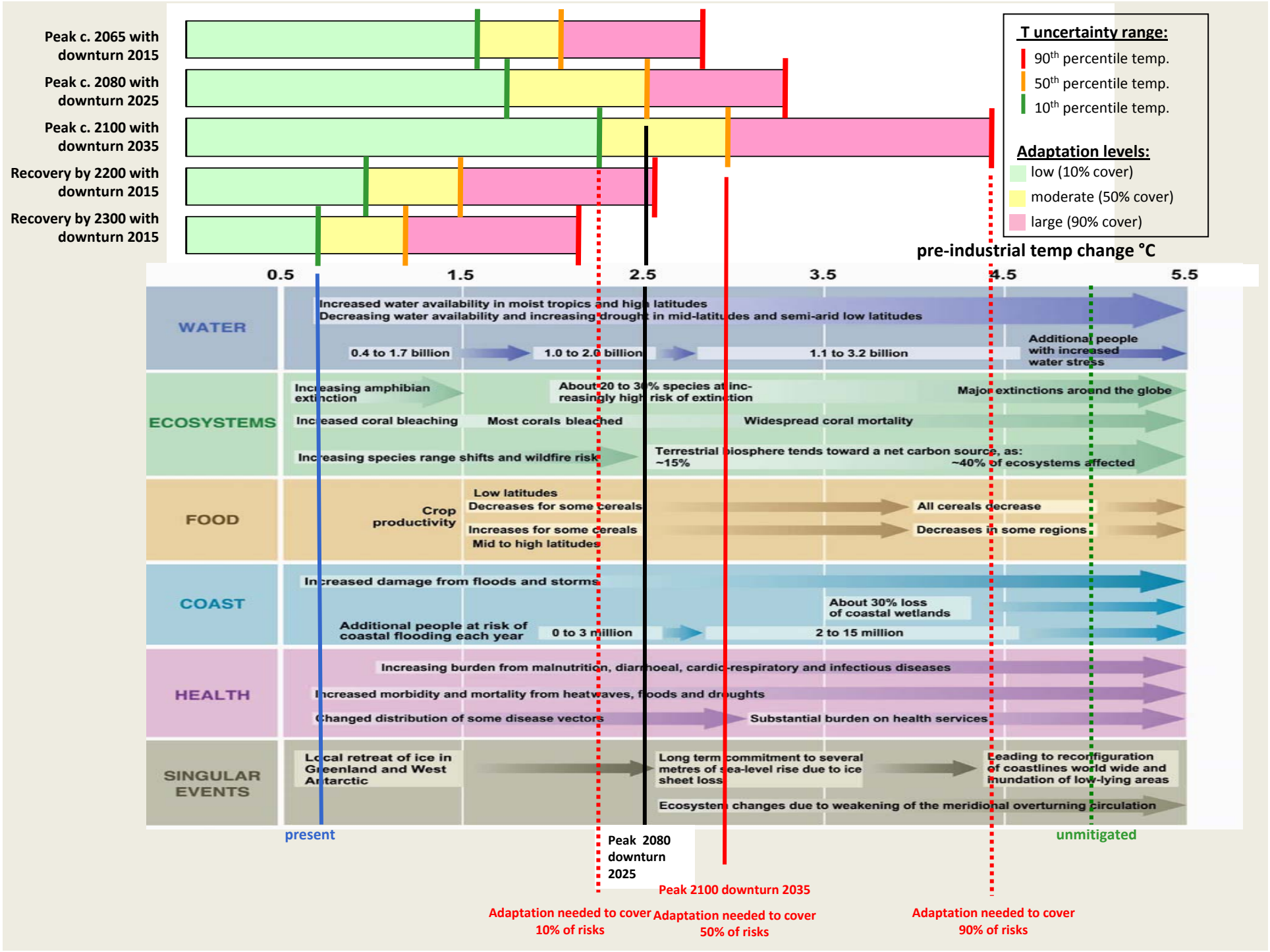
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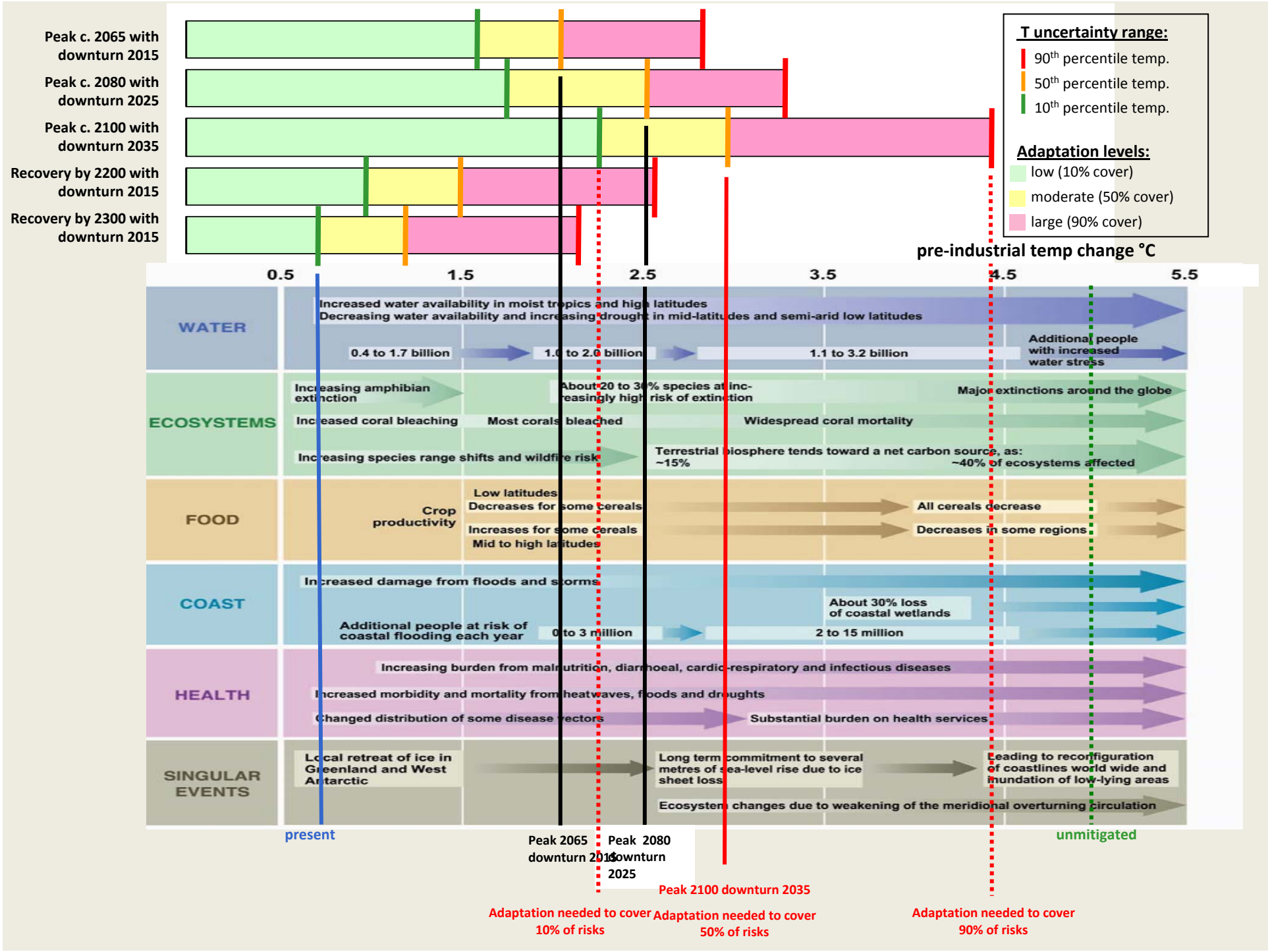
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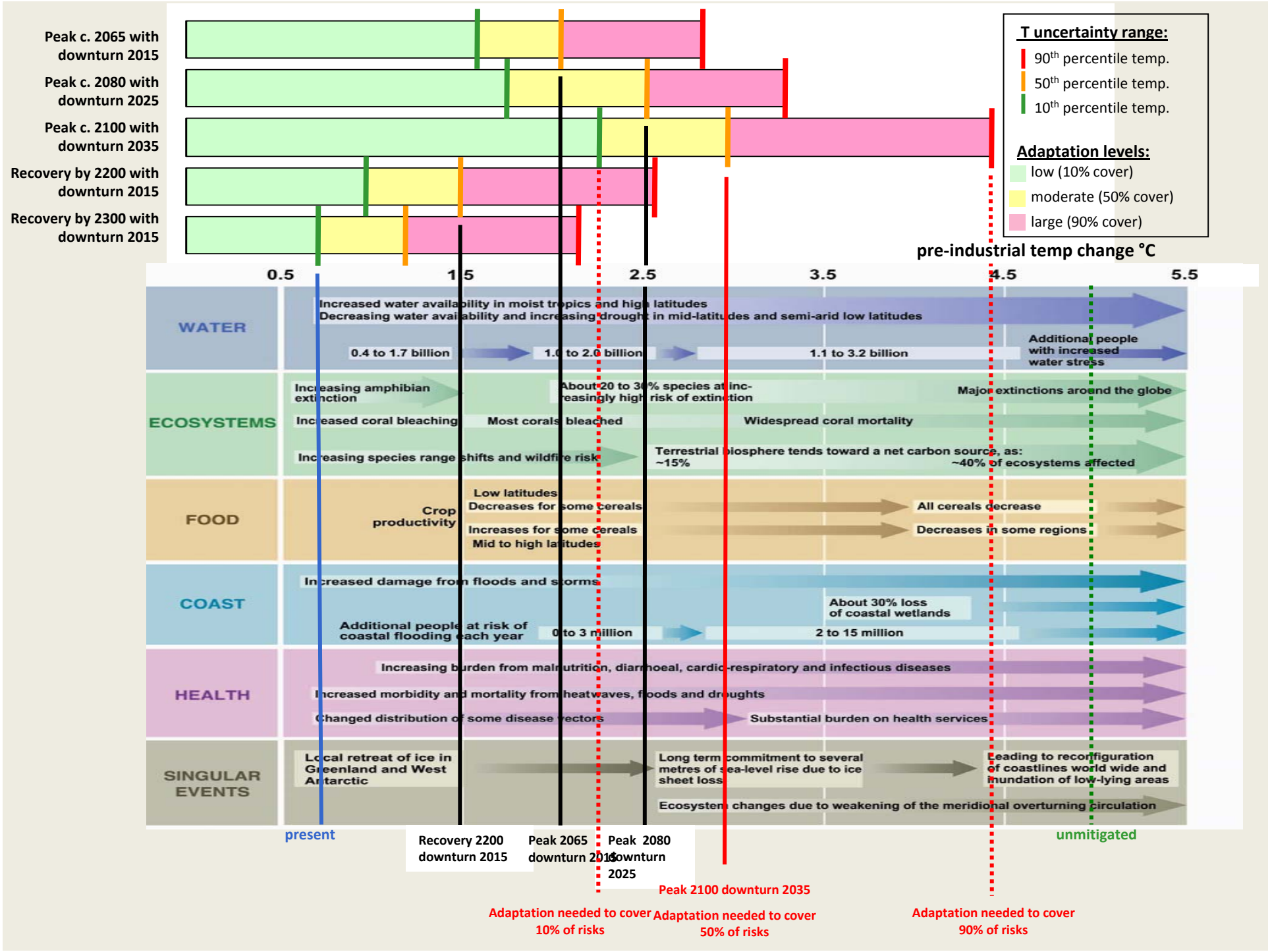
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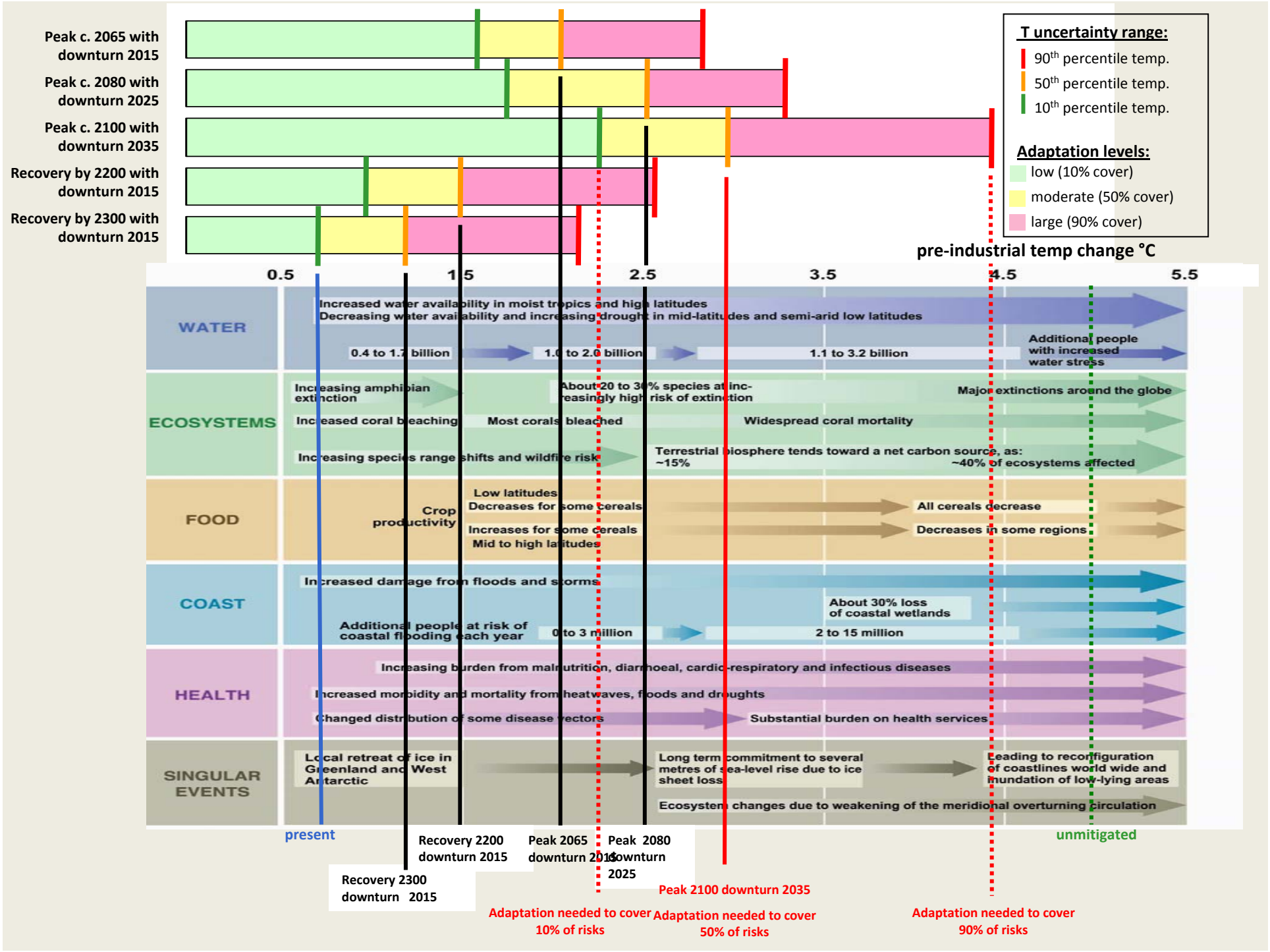
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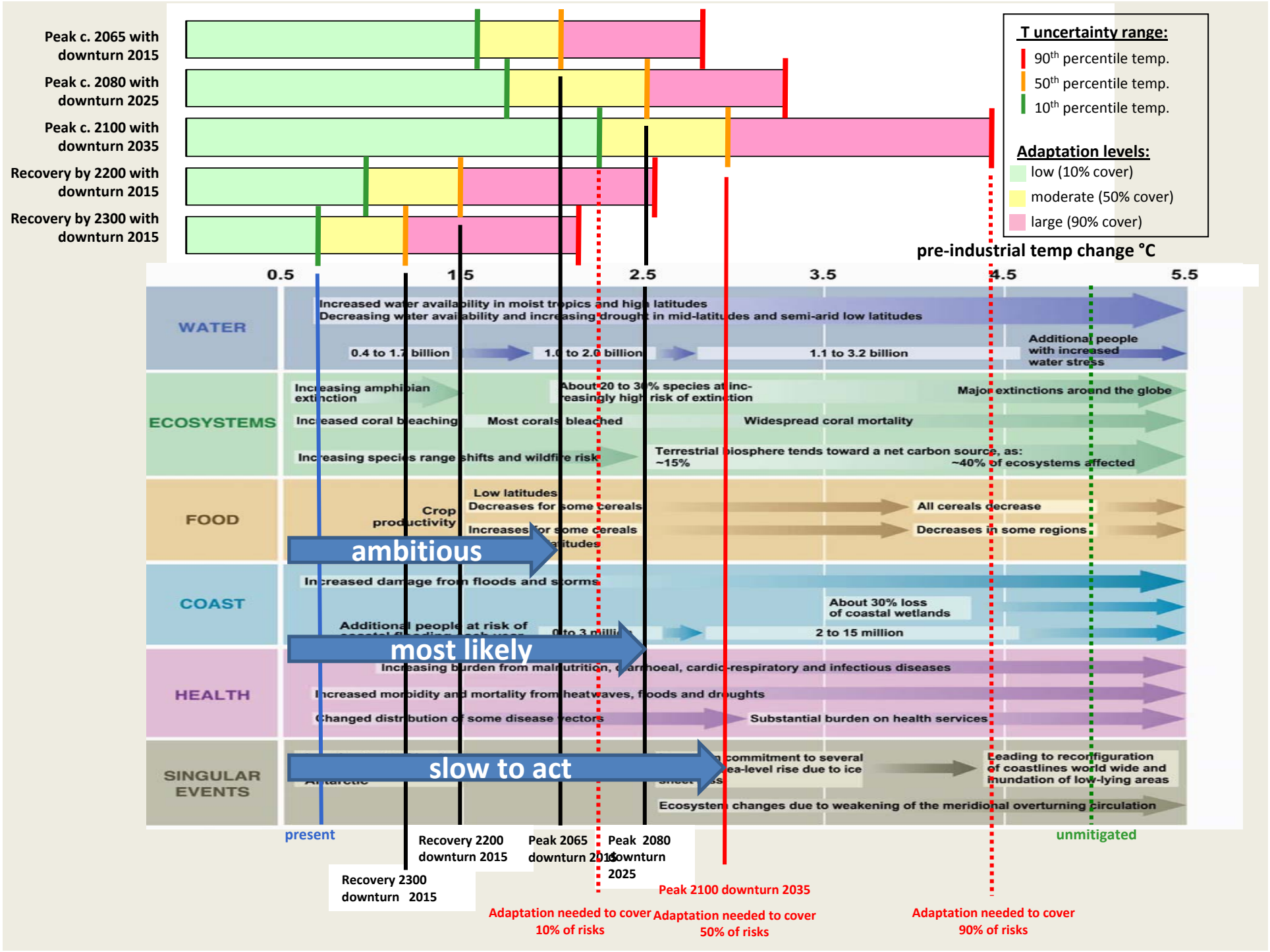
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Ecosystem changes due to weakening of the meridional overturning circulation
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present
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unmitigated
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Conclusions

Assuming we wish to cover only 50% of the climate risk:

- **We will almost certainly have to adapt to least 2 deg C of warming.**
- **Most likely we will have to adapt to 2.5 deg C.**
- **If we are slow to act on mitigation, we will probably need to adapt to 3 deg C.**

If we wish to cover 90% of the climate risk:

- **Add about 0.7 deg C to the above targets**

- **Thus, the scale of the adaptation challenge depends, hugely, on choices such as these.**