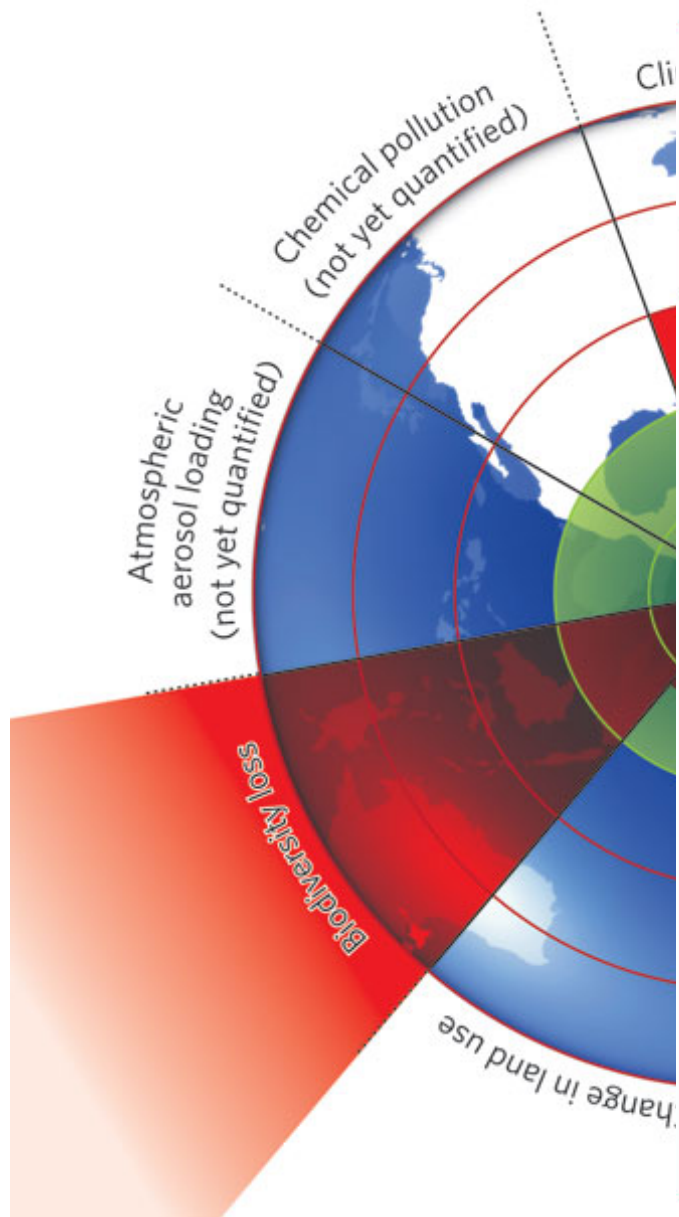


UN Briefing Session
New York, 2 Nov 2009

Copenhagen 2009: The Fierce Urgency of Now

Professor H. J. Schellnhuber CBE
Potsdam Institute for Climate Impact Research



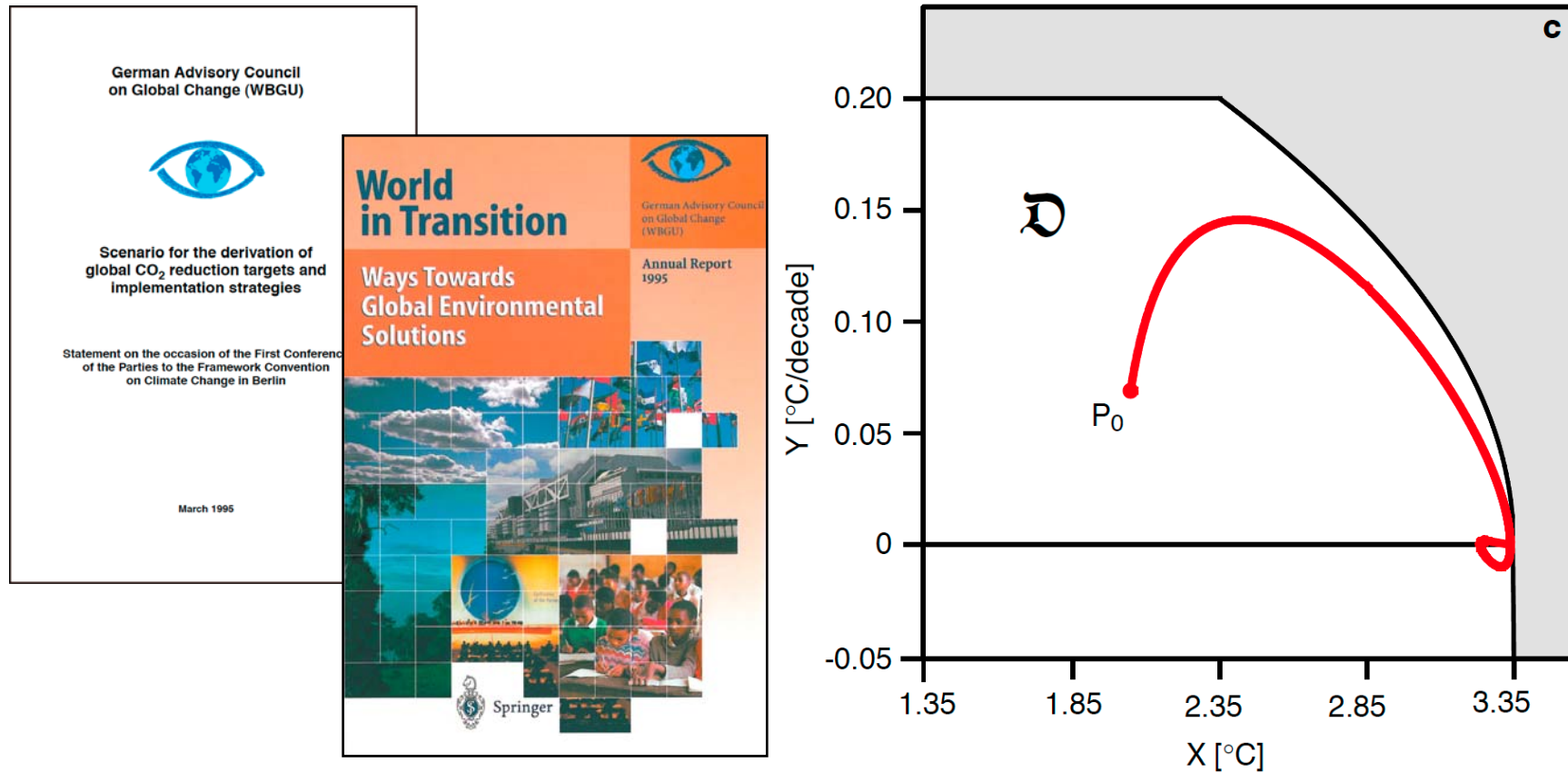


PLANETARY BOUNDARIES

Earth-system process	Parameters	Proposed boundary	Current status	Pre-industrial value
Climate change	(i) Atmospheric carbon dioxide concentration (parts per million by volume)	350	387	280
	(ii) Change in radiative forcing (watts per metre squared)	1	1.5	0
Rate of biodiversity loss	Extinction rate (number of species per million species per year)	10	>100	0.1-1
Nitrogen cycle (part of a boundary with the phosphorus cycle)	Amount of N ₂ removed from the atmosphere for human use (millions of tonnes per year)	35	121	0
Phosphorus cycle (part of a boundary with the nitrogen cycle)	Quantity of P flowing into the oceans (millions of tonnes per year)	11	8.5-9.5	~1
Stratospheric ozone depletion	Concentration of ozone (Dobson unit)	276	283	290
Ocean acidification	Global mean saturation state of aragonite in surface sea water	2.75	2.90	3.44
Global freshwater use	Consumption of freshwater by humans (km ³ per year)	4,000	2,600	415
Change in land use	Percentage of global land cover converted to cropland	15	11.7	Low
Atmospheric aerosol loading	Overall particulate concentration in the atmosphere, on a regional basis		To be determined	
Chemical pollution	For example, amount emitted to, or concentration of persistent organic pollutants, plastics, endocrine disrupters, heavy metals and nuclear waste in, the global environment, or the effects on ecosystem and functioning of Earth system thereof		To be determined	

Boundaries for processes in red have been crossed. Data sources: ref. 10 and supplementary information

1995: The WBGU Tolerable Windows Approach



First justification / operationalization of the 2° C guardrail

UNIVERSITY OF COPENHAGEN



SYNTHESIS REPORT

CLIMATE CHANGE

Global Risks, Challenges & Decisions
COPENHAGEN 2009, 10-12 March
www.climatecongress.ku.dk

Katherine Richardson
Will Steffen
Hans Joachim Schellnhuber
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Balgis Osman-Elasha
Nicholas Stern
Ole Wæver



Australian National University, ETH Zürich, National University of Singapore,
Peking University, University of California - Berkeley, University of Cambridge,
University of Copenhagen, University of Oxford, The University of Tokyo, Yale University

Key Message 2 - Social and Environmental Disruption

„Temperature rises above 2°C [...] are likely to cause major societal and environmental disruptions through the rest of the century and beyond.“

Global mean annual temperature change relative to 1980-1999 (°C)

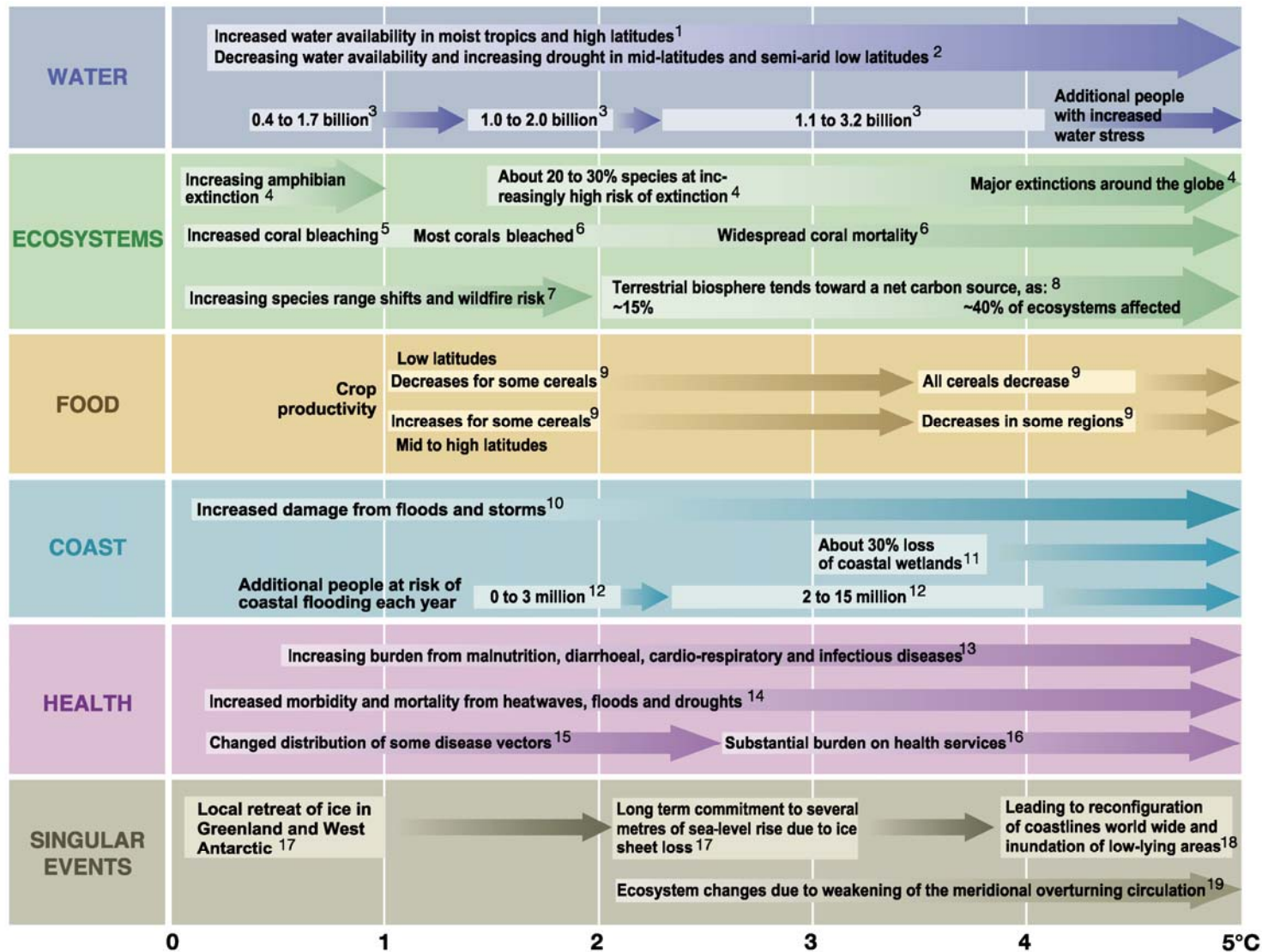
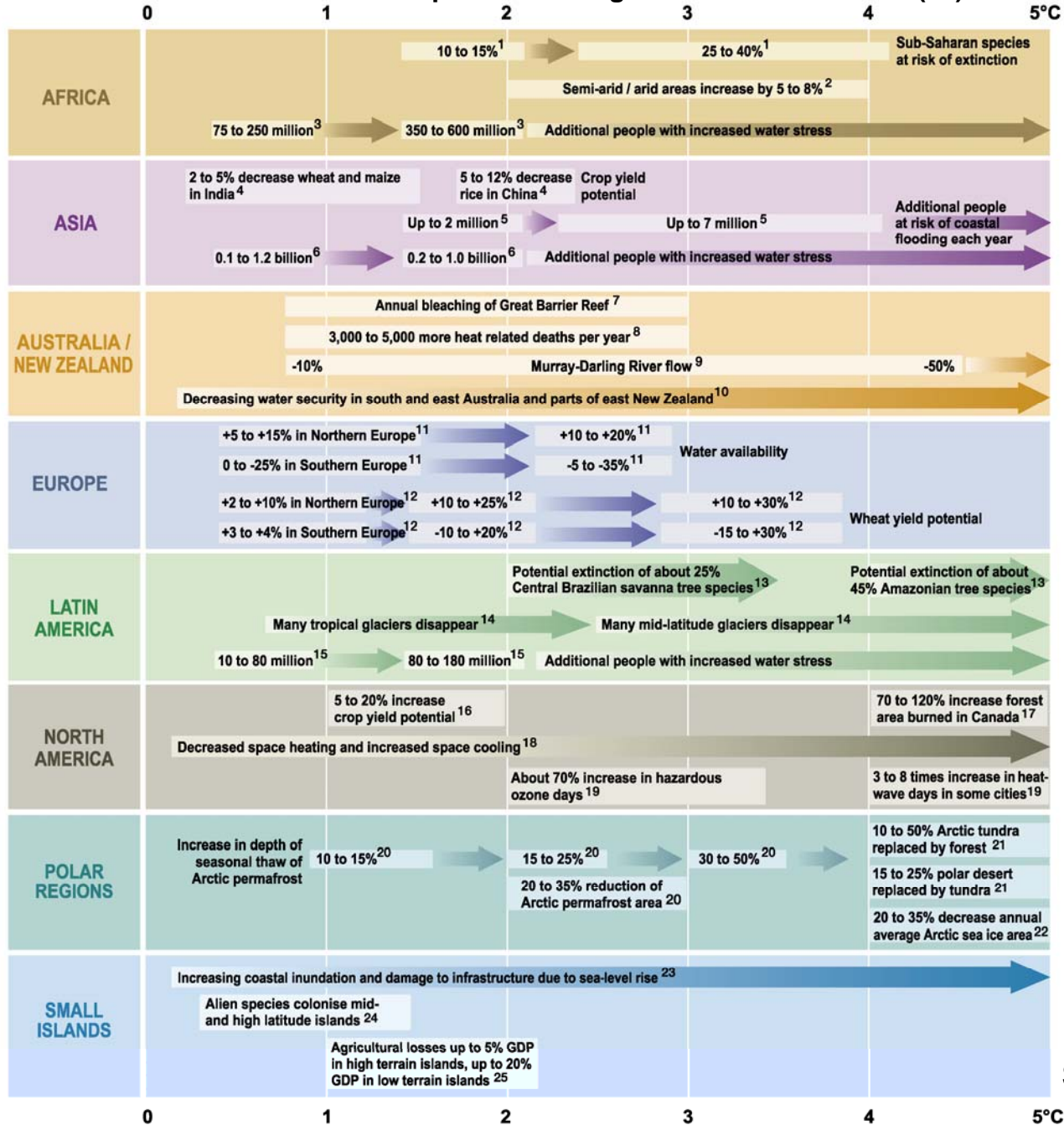


Table TS.3. Examples of global impacts projected for changes in climate (and sea level and atmospheric CO₂ where relevant) associated with different amounts of increase in global average surface temperature in the 21st century [T20.8]. This is a selection of some estimates currently available. All entries are from published studies in the chapters of the Assessment. (Continues below Table TS.4.)

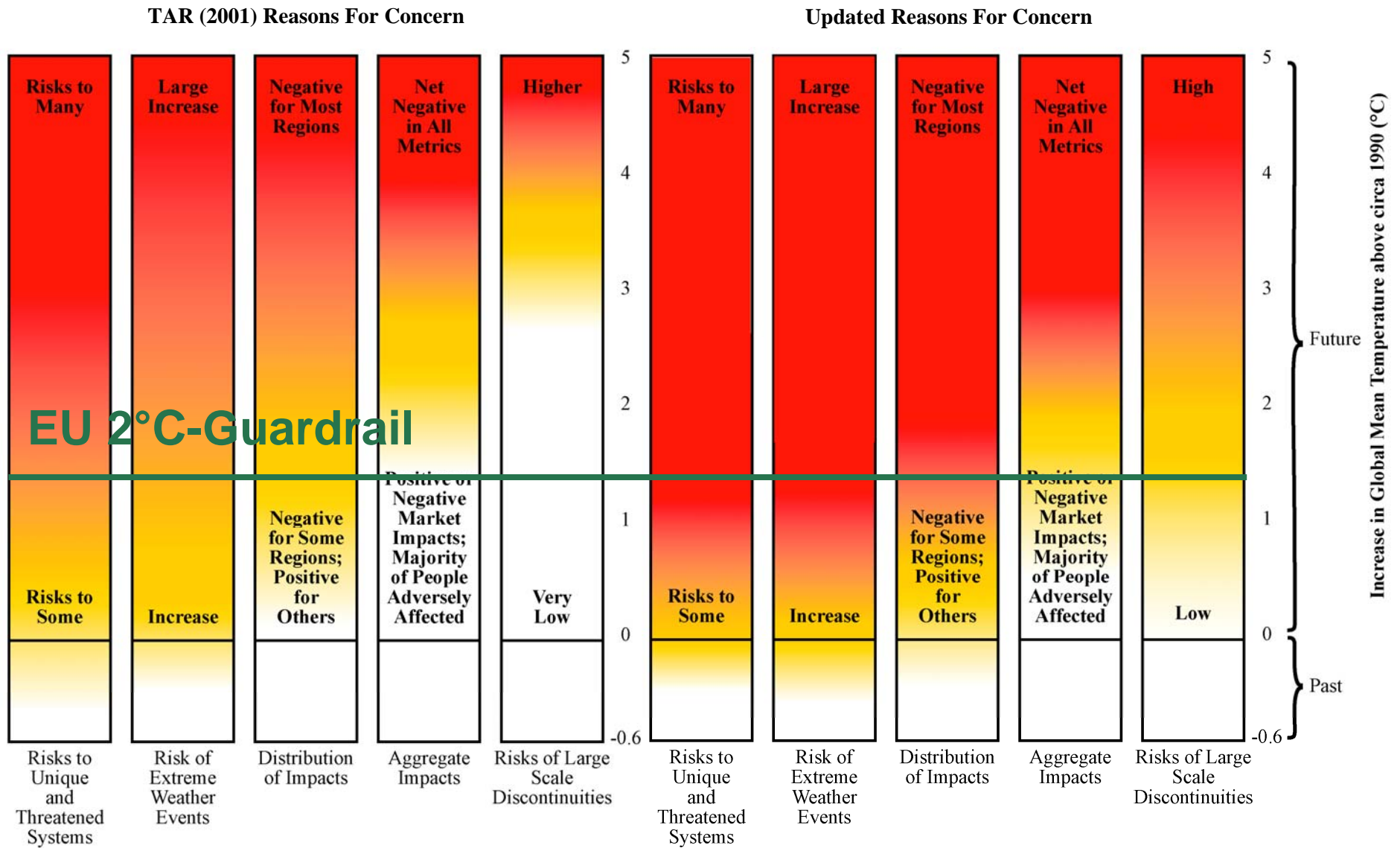
Source: IPCC

Global mean annual temperature change relative to 1980-1999 (°C)



Source: IPCC

Updated Reasons for Concern



Source: Synthesis Report (Smith et al. 2009 PNAS)

Tipping elements in the Earth's climate system

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