Differences in climate impacts between 1.5°C and 2°C

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1.5°C in the Paris Agreement

Paris Agreement included the aim to hold the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, noting that the latter would *"significantly reduce the risks and impacts of climate change"*

New science further outlines how the risks and impacts of climate change increase between 1.5°C and 2°C including for slow-onset events as well as extreme events and abrupt shifts.

Steep increase in abrupt shifts between 1.5°C and 2°C

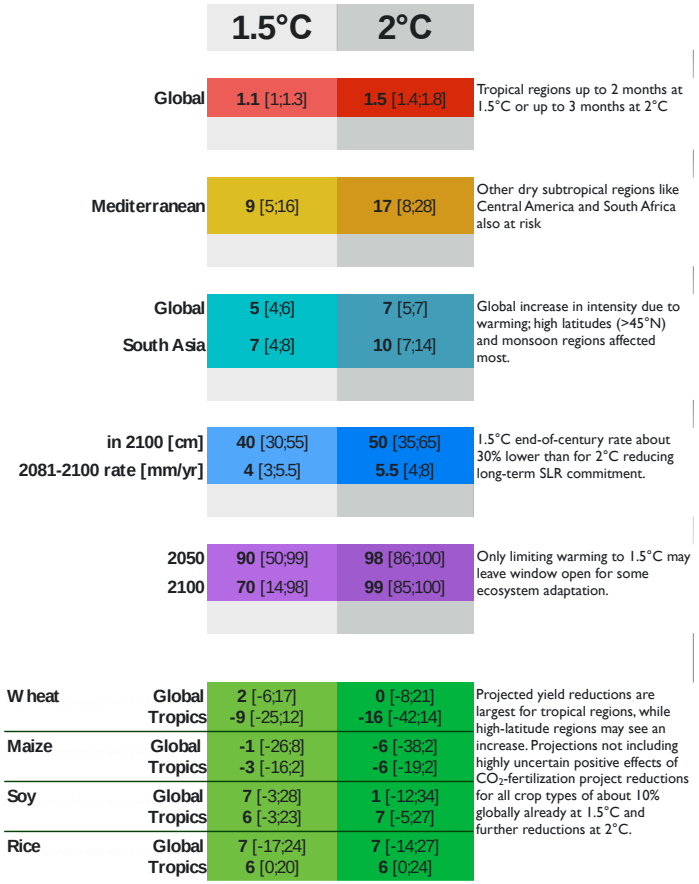
- A recent publication presented a "Catalogue of abrupt shifts in Intergovernmental Panel on Climate Change climate models" by Drijfhout et al. (2015)
- Their research revealed evidence of 37 forced regional abrupt changes with temperature increase in the ocean, sea ice, snow cover, permafrost, and terrestrial biosphere

	1.5°C	2°C
Number of crossed thresholds of abrupt shifts in earth system models	~ 20%	~ 50%

Drijfhout, S. *et al.* Catalogue of abrupt shifts in Intergovernmental Panel on Climate Change climate models. *Proc. Natl. Acad. Sci.* 201511451 (2015). doi:10.1073/pnas.1511451112

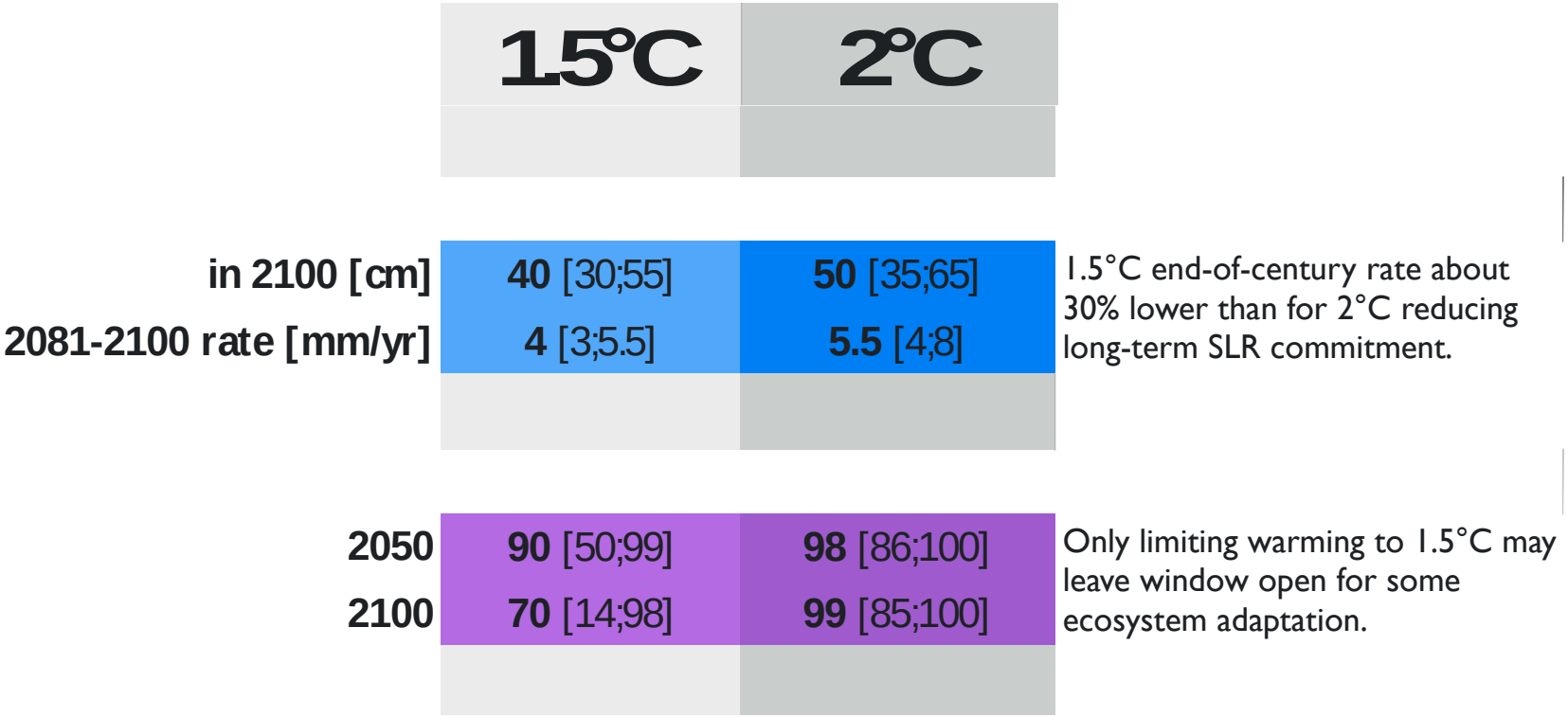
Regional assessment of differences between 1.5°C and 2°C

- **New systematic assessment** of differences in climate impacts between 1.5°C and 2°C warming for 11 key impact indicators
- **Regional perspective** shows significant differences between 1.5°C and 2°C at the regional level for all indicators that were considered
- **Regional hot-spots of change emerge** with **tropical regions bearing the brunt** of the impacts of an additional 0.5°C warming



Schleussner et al.: Differential climate impacts for policy-relevant limits to global warming: the case of 1.5°C and 2 °C Earth Syst. Dynam., 7, 1–25, 2016 doi:10.5194/esd-7-1-2016

Global sea-level rise and risk of coral reef loss



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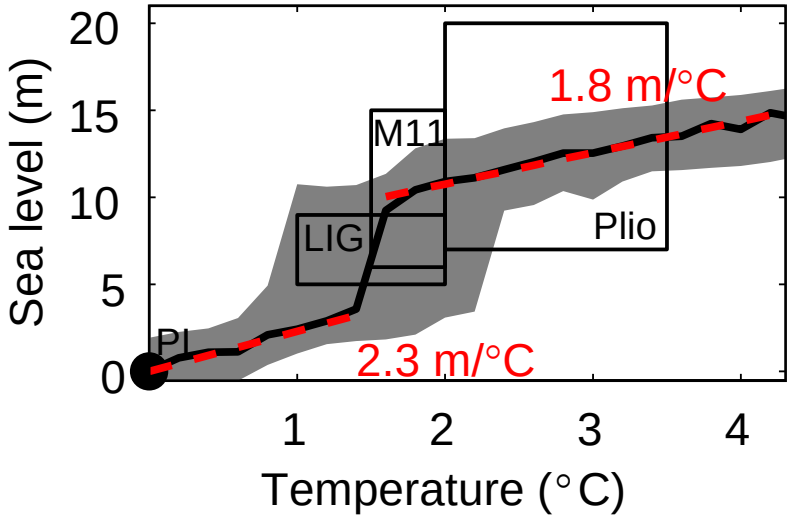
Global sea-level rise and risk of coral reef loss

Long-term Sea-level rise

in 2

2081-2100 rate



end-of-century rate about
wer than for 2°C reducing
rm SLR commitment.

miting warming to 1.5°C may
window open for some
tem adaptation.

Levermann, A. et al. PNAS (2013).

Schleussner et al.: Diff
warming: the case of 1.5 °C and 2 °C Earth Syst. Dynam., 7, 1–25, 2016
doi:10.5194/esd-7-1-2016

Implications for future scientific assessments

- Scoping of the 1.5°C special report should include assessments of slow-onset events
- Next IPCC should aim to include comprehensive information on lowest levels of slow-onset impacts, irreversible changes and tipping points as well as avoidable increases in severity of extreme climate-related events
- To provide this information, WCRP should ensure that 1.5°C scenarios are included in the upcoming Coupled Model Intercomparison Project 6 (CMIP6) as a Tier 1 scenario