

The risks of temperature overshoot: input to the first Global Stocktake



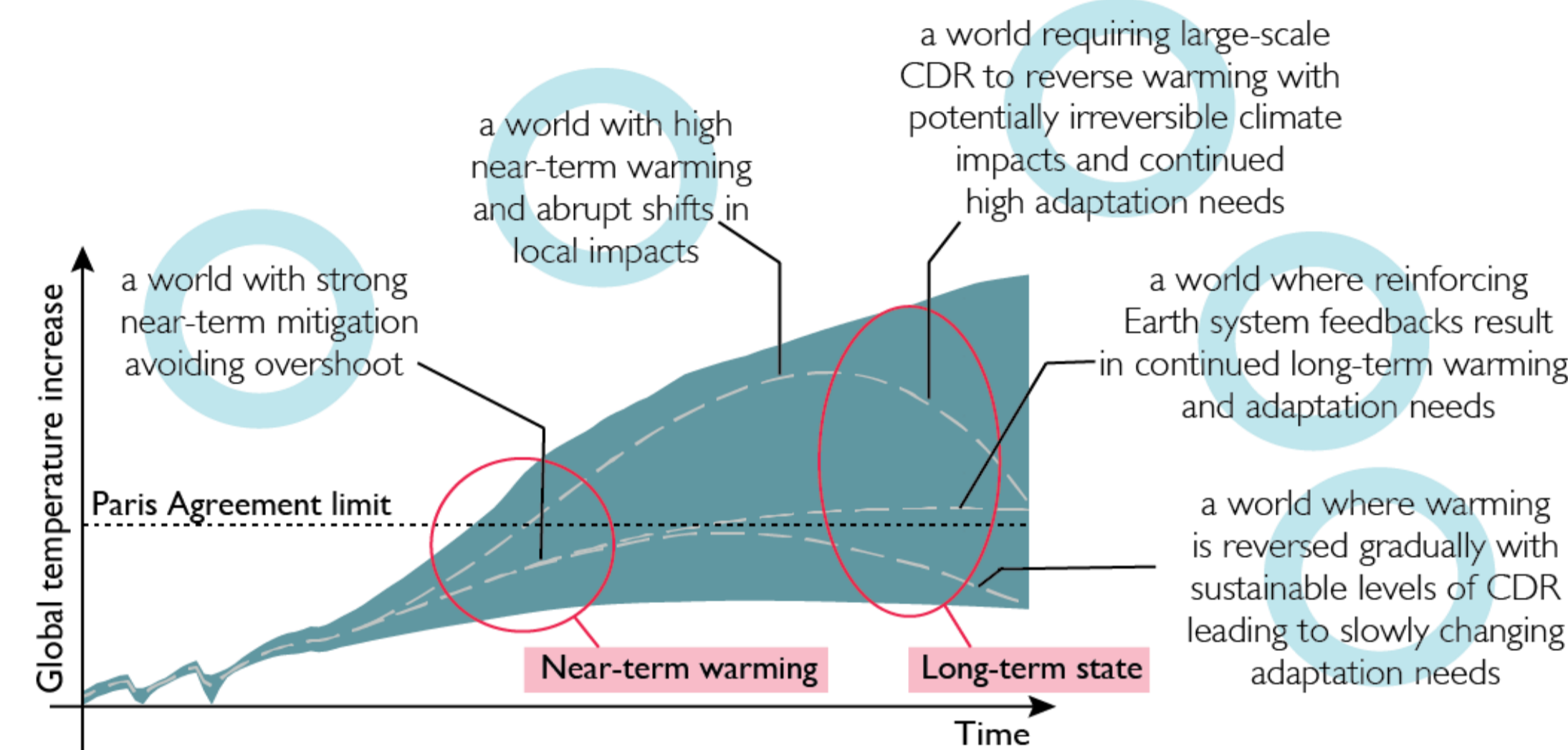
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Efforts to avoid or minimise the magnitude and duration of overshooting 1.5°C, by curbing emissions before 2025, are vital to minimising risks and impacts.

Why focus on overshoot?

- Continual delays to strong mitigation action are increasing the possibility that we will exceed the Paris Agreement's 1.5°C limit, at least temporarily.
- We need to consider what overshoot means for mitigation, adaptation, and Loss and Damage, and use this to inform both current climate action and the next round of NDCs.
- Although there are still uncertainties, only strong climate action now can minimise the wide range of risks and impacts that overshooting 1.5°C could present.

Core DETERMINANTS and IMPLICATIONS of different OVERSHOOT trajectories on warming outcomes, climate impacts and adaptation needs



A summary of core determinants and implications of different overshoot trajectories on warming outcomes, climate impacts and adaptation needs

Mitigation

Even most of the IPCC's very low emissions scenarios show temperatures temporarily exceeding 1.5°C, even if "only" by around 0.1°C for around 15 years

- Minimising the risk of overshooting 1.5°C, and keeping any overshoot that does occur to "well below 2°C", means roughly halving GHG emissions by 2030.
- Strong near-term mitigation of non-CO₂ GHGs e.g. methane is critical to limiting and delaying temperature overshoot.
- Bringing temperatures down after overshoot will require carbon dioxide removal (CDR), but there are still substantial uncertainties around CDR in terms of climate and Earth system feedbacks.

Adaptation

Every bit of avoided warming will benefit adaptation efforts and lower the risk of human and natural systems reaching adaptation limits

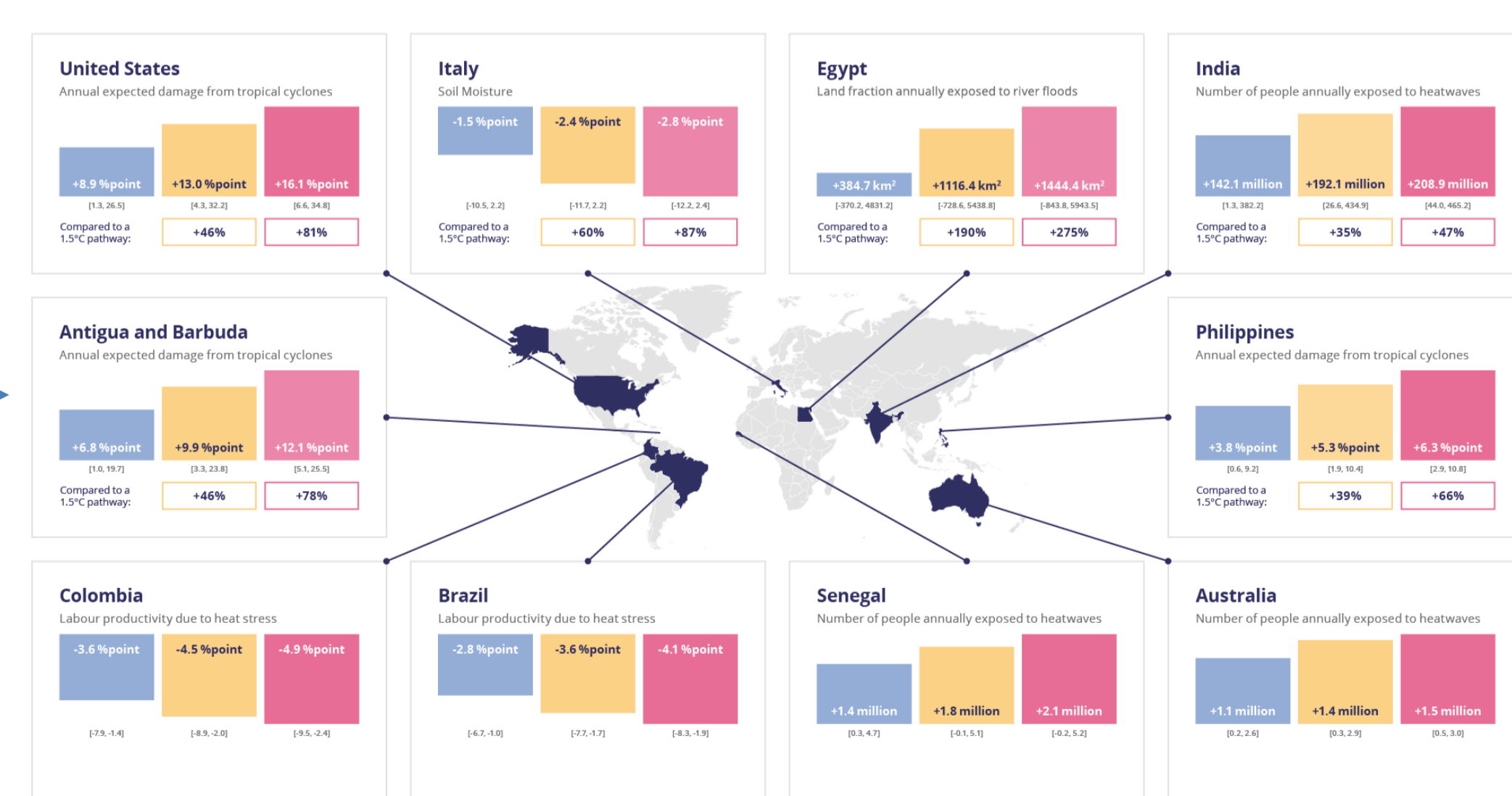
- Even a temporary overshoot would put additional strains on human and natural systems.
- But strong mitigation could slow down the pace of warming by the 2030s, buying more time for adaptation.

A scenario that meets all Paris Agreement criteria and limits global warming to 1.5°C with a 50% chance, comparable to the IPCC AR6 WGIII 1.5°C-consistent illustrative mitigation pathways SP, LD, and Ren

A scenario that only assumes climate mitigation measures as of COP26 without strengthening ambition before 2030, but also capturing all net zero emission targets adopted or discussed in more than 140 countries

A scenario which captures all existing international emission reduction pledges to 2030 as of COP26, like the ModAct illustrative pathway in terms of mitigation assumptions

ILLUSTRATIVE 2050 CLIMATE IMPACTS



Examples of climate impacts in 2050 as a result of three different global warming levels (blue: 1.5°C; yellow: 1.7°C; pink: 1.8°C) in different countries

Loss and Damage

Delayed climate action will see continued warming into the 2030s and beyond, and higher chances of overshooting 1.5°C, further increasing Loss and Damage

- Some consequences of overshoot such as biodiversity and habitat loss will be irreversible.
- Bringing temperatures back down after overshoot will still mean less long-term Loss and Damage.
- But even if temperatures are brought down, we will not return to where we were before.

