

47th Session of the World Climate Research Programme
Joint Scientific Committee

Safe Landing Climates

We aim to answer two questions (Sherwood et al., *Earth's Future*, 2024):

- What potential high-impact climate hazards, surprises or irreversible changes should society be genuinely worried about and how can the associated risks be usefully quantified and communicated?
- What do achievable, internally consistent and safe pathways to a future climate look like that also meet broader human needs, and how can we identify them?

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SLC Research Themes

- **Theme 1.** Understanding High risk events: tipping points, large scale high risk events across earth system and earth/human system
- **Theme 2.** Perturbed Carbon Cycle: Overshoot scenarios, implications of and risks from negative emission scenarios
- **Theme 3.** Water Resources: Focus on Amazon and its teleconnections
- **Theme 4.** Sea Level Rise: identifying limits to habitability, engagement with user communities;
- **Theme 5.** Safe Landing Pathways: identifying risks on way to mitigated climate => gaming approaches, collaboration with industry

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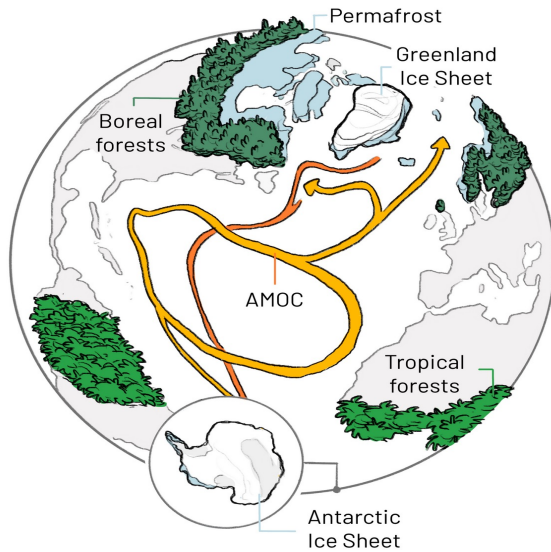


SLC Structure

Steven Sherwood
Gabi Hegerl

Understanding High-Risk Events	Perturbed Carbon Cycle	Water Resources	Sea Level Rise	Safe Landing Pathways
Bette Otto-Bliesner Gabi Hegerl	Pierre Friedlingstein Chris Jones	Christiano Chiessi Nathalie Philippon	Molly Mitchell Elisabeth Holland	Neil Harris Lisa Miller
Hannah Liddy Thomas Lontzek Izidine Pinto Ryan Sriver Laura Suarez-Gutierrez	Ana Bastos Rosie Fisher Wei Li Neil Harris Irina Melnikova Roland Séférian Joerg Schwinger Gyami Shrestha Sophie Szopa Soenke Zaehle	Ramia Al Bakain Benjamin Gwinneth Hyungjun Kim Paulo Nobre Kazuyoshi Suzuki	Benjamin Hamlington Svetlana Jevrejeva Christopher Little Roshin P. Raj Swapna Panickal	Peter Alexander Marco J. Cabrerizo Felix Donkor Luke Harrington Kevin Reed Ayansina Ayanlade Marco J. Cabrerizo Mauricio Domínguez-Aguilar Natasha Kuruppu Urooj Raja

Tipping Assessment



- Title: **High impact climate events, tipping points and irreversible regional impacts: how robust is our understanding?**
- Authors: Gabi Hegerl and ~75 others
- Scope: physical science, ecosystems and human systems; global and regional tipping / threshold behaviour
- Key research questions: prioritising risks, model assessment, opportunities for WCRP science.
- Working with AR7 (joint meeting). Build framework.
- Just completed first draft. Aim to submit by mid-year, targeting *Reviews of Geophysics*.

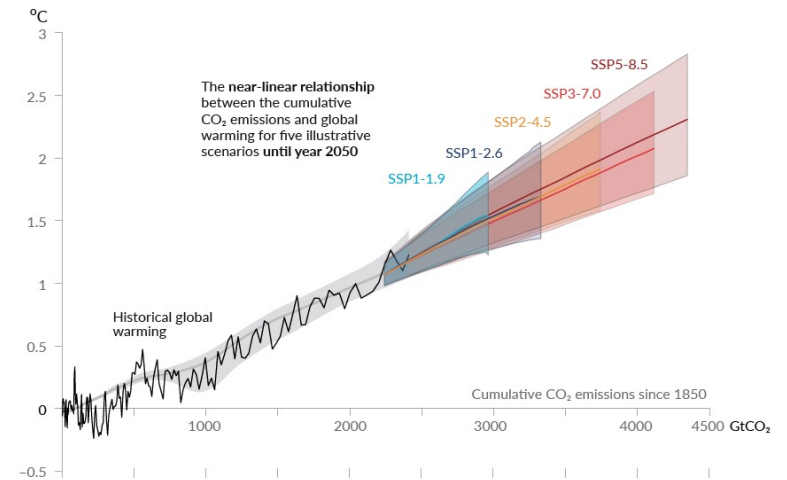
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TCRE Assessment

- Title: Transient Climate Response to cumulative Emissions (TCRE) and Zero Emissions Commitment (ZEC) Assessment
- Authors: Chris Jones, Roland Séférian, Pierre Friedlingstein et al.
- Joint project with ESMO.
- Use Bayesian approach following *Sherwood et al. 2020*, including an update of $p(\text{ECS})$.
- Planned submission before end of the year.



Other Current Activities

- Tipping Point Discussion Series still going with Future Earth
- Global Economic Risk: perspective paper being drafted to submit mid-year (Sherwood)
- Cascading Shocks: review paper being drafted (Saurez-Gutierrez)
- Visualizing Water Resources under Climate Change: will be made into a web site (Chiessi)

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Future plans and priorities

- Main activities (Tipping report, TCRE assessment, two other papers) expected to wrap up in 2026.
- Possible Sea Level WG link to new Task Team
- Summer school in cascading risks and associated topics, for 2027?
- Some webinars planned (climate intervention pathways; sea level)
- Continuation of Global Economic Risk activity with industry partners; (presence at London Climate Action Week)
- Have recently added nearly 200 “Affiliate members,” mostly from Global South
- We will have a pan-SLC online meeting in- June/July to identify possible new directions or activities (or decide to sunset!)

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Suggestions, issues or challenges



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Thank You



Additional slides and information

- *Any additional info that you would like the JSC to be aware of but that you won't have time to present*

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