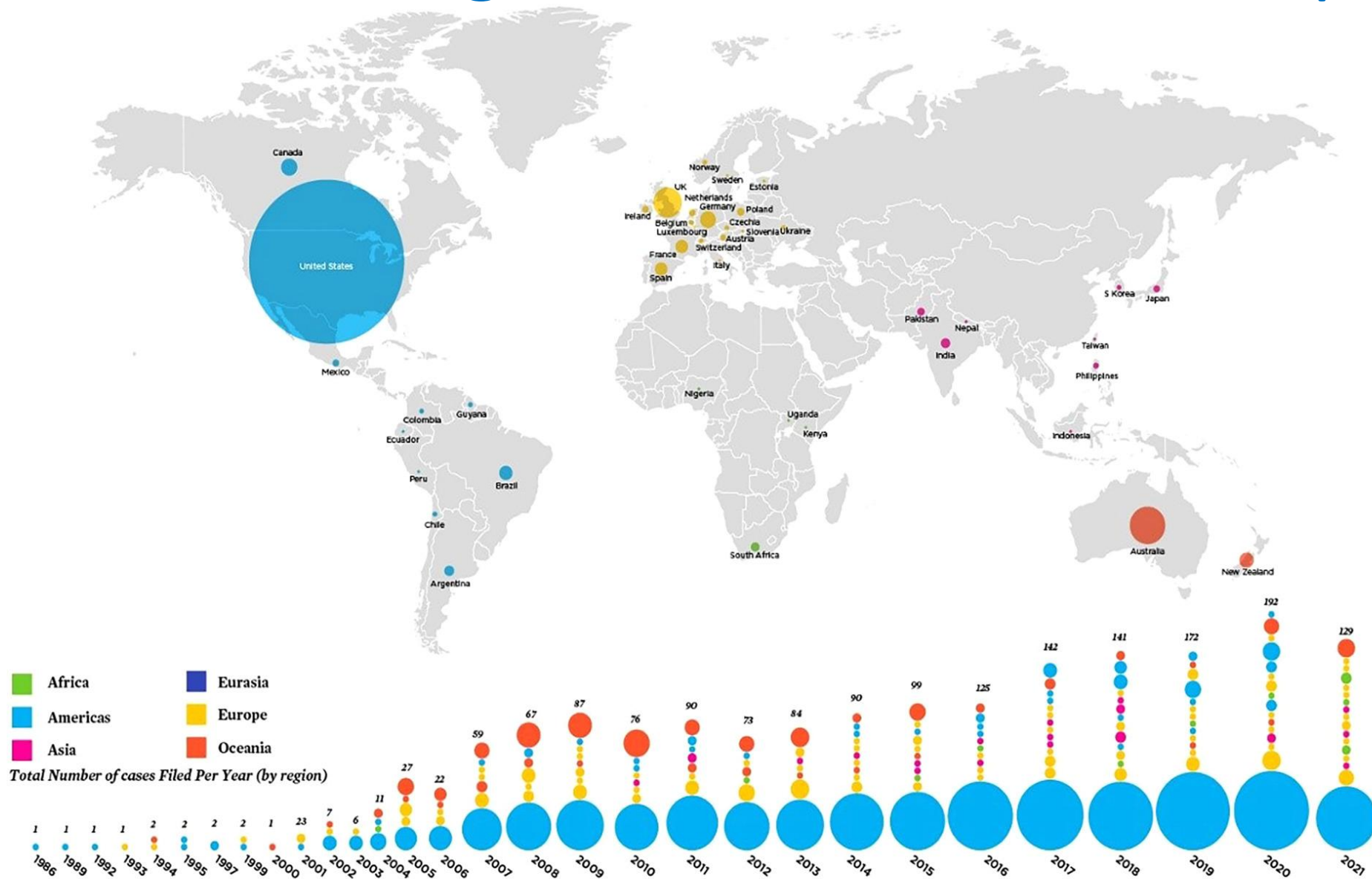


Using climate modeling to inform climate litigation and advance climate justice

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Science
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@ScienceShaina



Climate litigation across time and space



Source data: Sabin Center and LSE

Types of cases currently

- Climate rights- insufficient action violates plaintiffs rights to life, health, food, water, liberty, cultural heritage
- Domestic policy enforcement
- Keeping fossil fuels in the ground
- Corporate liability, responsibility, greenwashing
- Failure to adapt

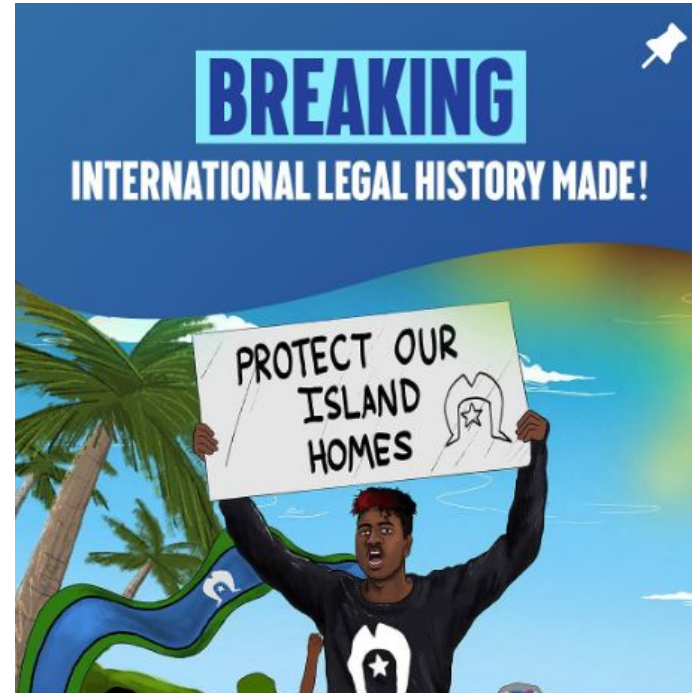


Image via IG @OurIslandsOurHome



The Torres Strait 8: Yessie Mosby, Nazareth Fauid, Stanley Marama, Kabay Tamu, Keith Pabai, Nazareth Warria, Daniel Billy, Ted Billy. Photo 350 Australia.

Happening Today

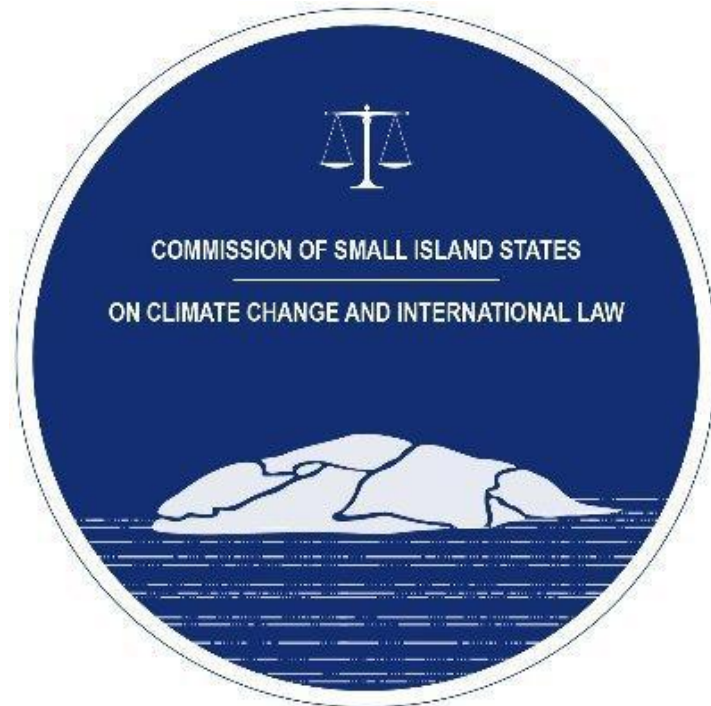
Held v. State of Montana goes to trial today

First US case claiming constitutional rights to a safe and stable climate

16 youth plaintiffs challenge Montana legislation which bans “evaluation of greenhouse gas emissions and corresponding impacts to the climate” in environmental impact assessments for infrastructure like pipelines



International Advisory Opinions



What are the specific obligations of State Parties to the United Nations Convention on the Law of the Sea:

(a) to prevent, reduce and control pollution of the marine environment in relation to the deleterious effects resulting from climate change which are caused by anthropogenic greenhouse gas emissions into the atmosphere?

(b) to protect and preserve the marine environment in relation to climate change impacts, including ocean warming and sea level rise, and ocean acidification?

(paraphrased)

International Advisory Opinions



*Announcement by the Government of Vanuatu
on the adoption of an historic UN General Assembly Resolution
for an Advisory Opinion on Climate Change
from the International Court of Justice
adopted by consensus on 29 March 2023*

1. What are the obligations of States under international law to ensure the protection of the climate system for present and future generations;
2. What are the legal consequences for States where they have caused significant harm to the climate system and environment, with respect to:
 - a. States, in particular, small island developing States, which due to their geographical circumstances and level of development, are injured or affected by the adverse effects of climate change?
 - b. Peoples and individuals of the present and future generations affected by the adverse effects of climate change?

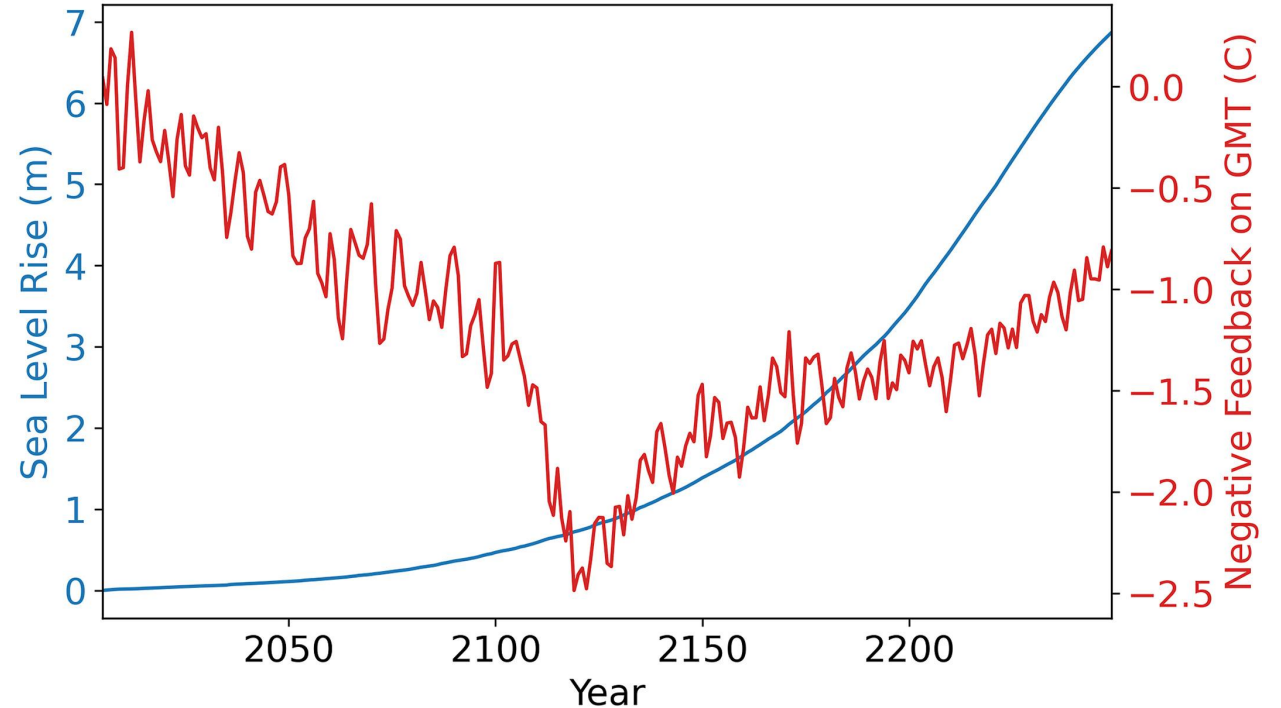
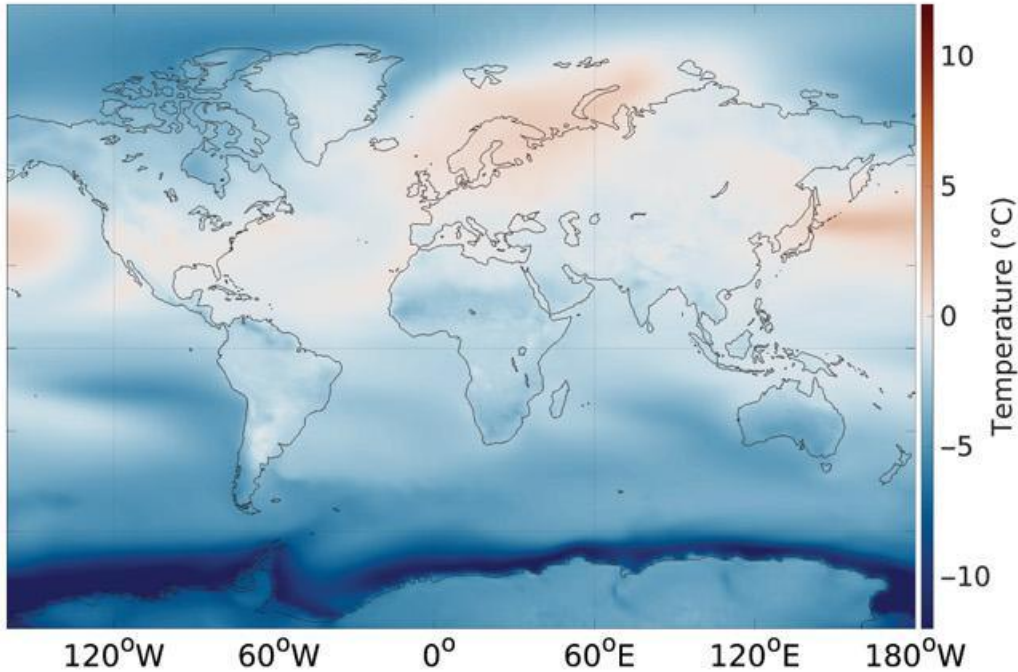
(paraphrased)



Cases rely on climate research



Climate modeling and climate justice



Sadai et al., 2020

Earth's Future




REVIEW ARTICLE

10.1029/2022EF002940

Key Points:

- This review considers the Paris

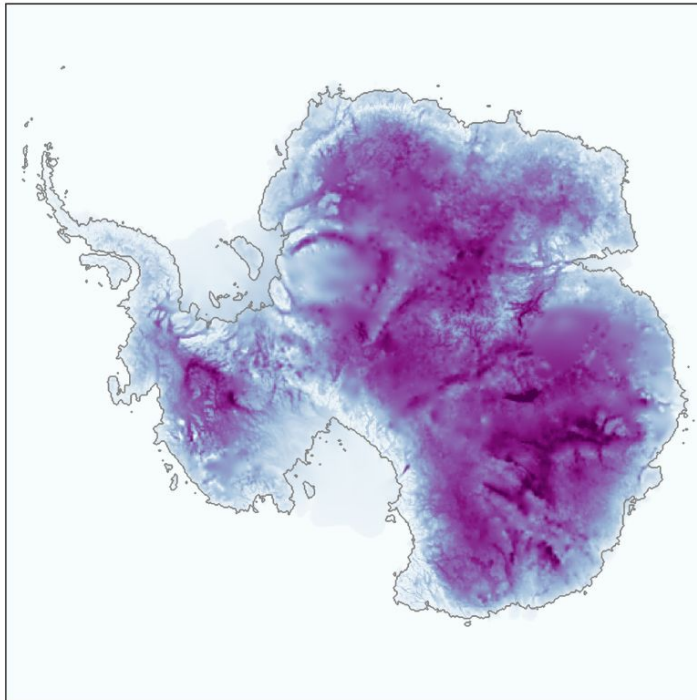
The Paris Agreement and Climate Justice: Inequitable Impacts of Sea Level Rise Associated With Temperature Targets

S. Sadai^{1,2} , R. A. Spector¹, R. DeConto¹ , and N. Gomez³ 



Coupled modeling to constrain feedbacks and tipping points

PSU3D



Ice thickness (m)

4000
3500
3000
2500
2000
1500
1000
500
0

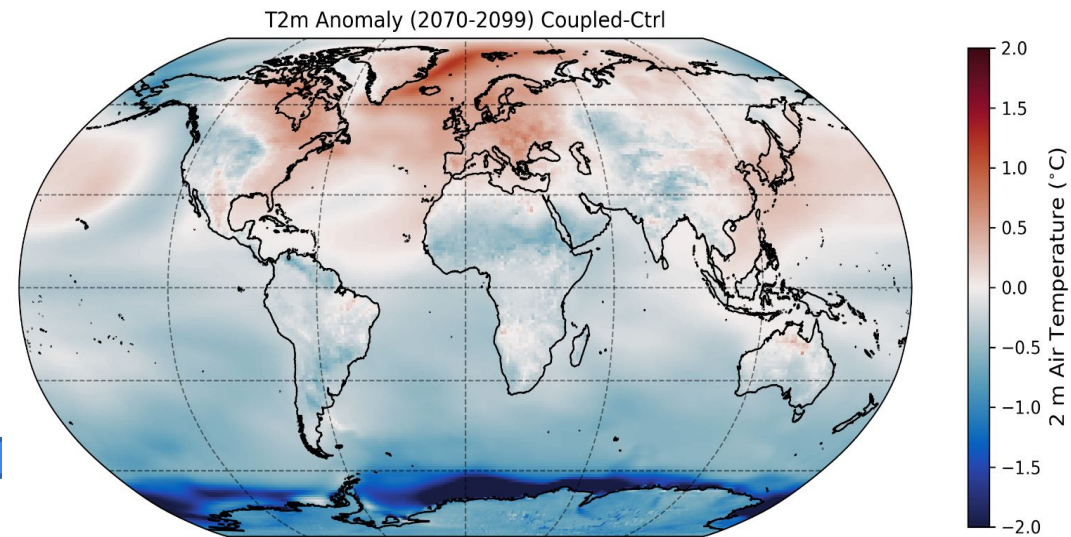
Meltwater



Air temps, 400 m
ocean temps, precip

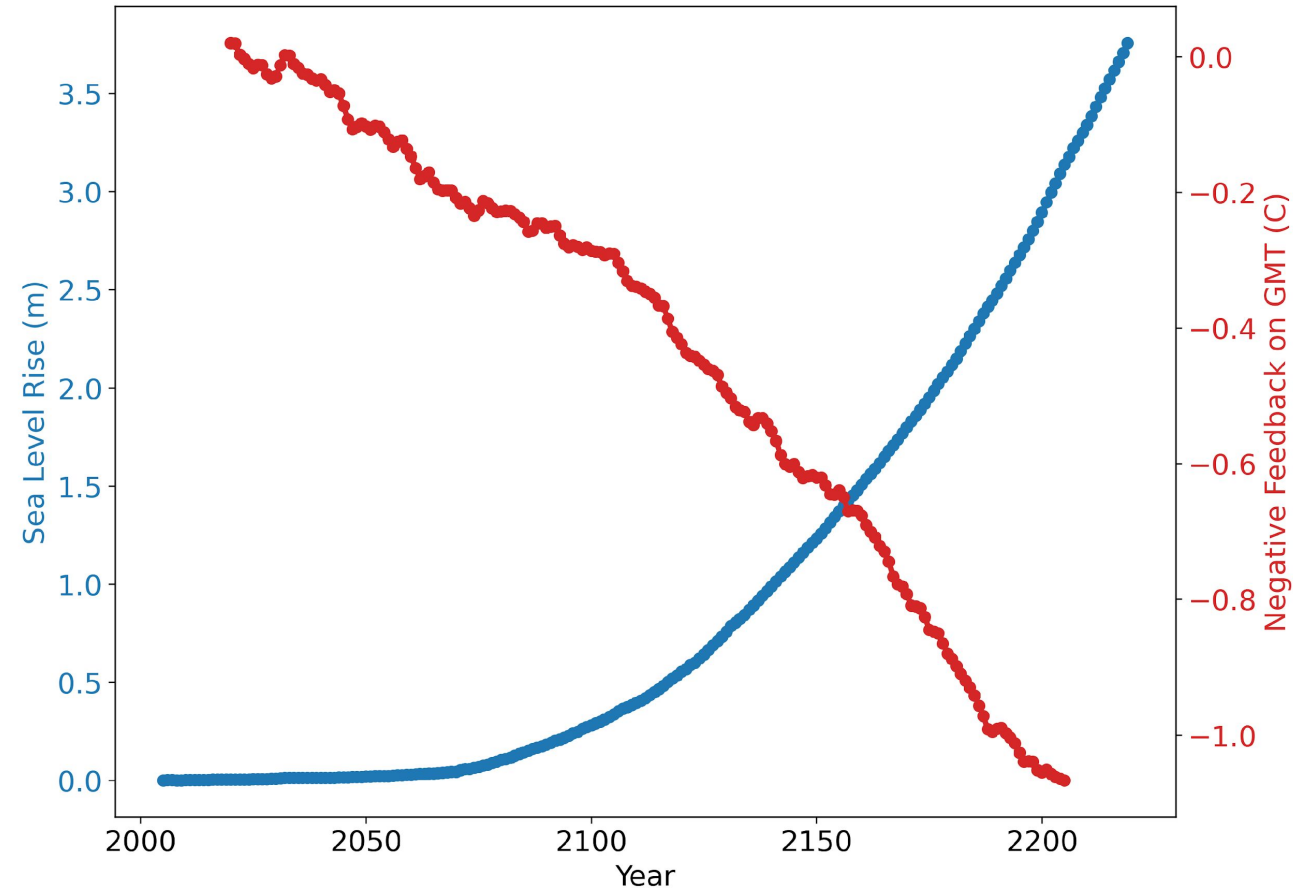


CESM1-CAM5



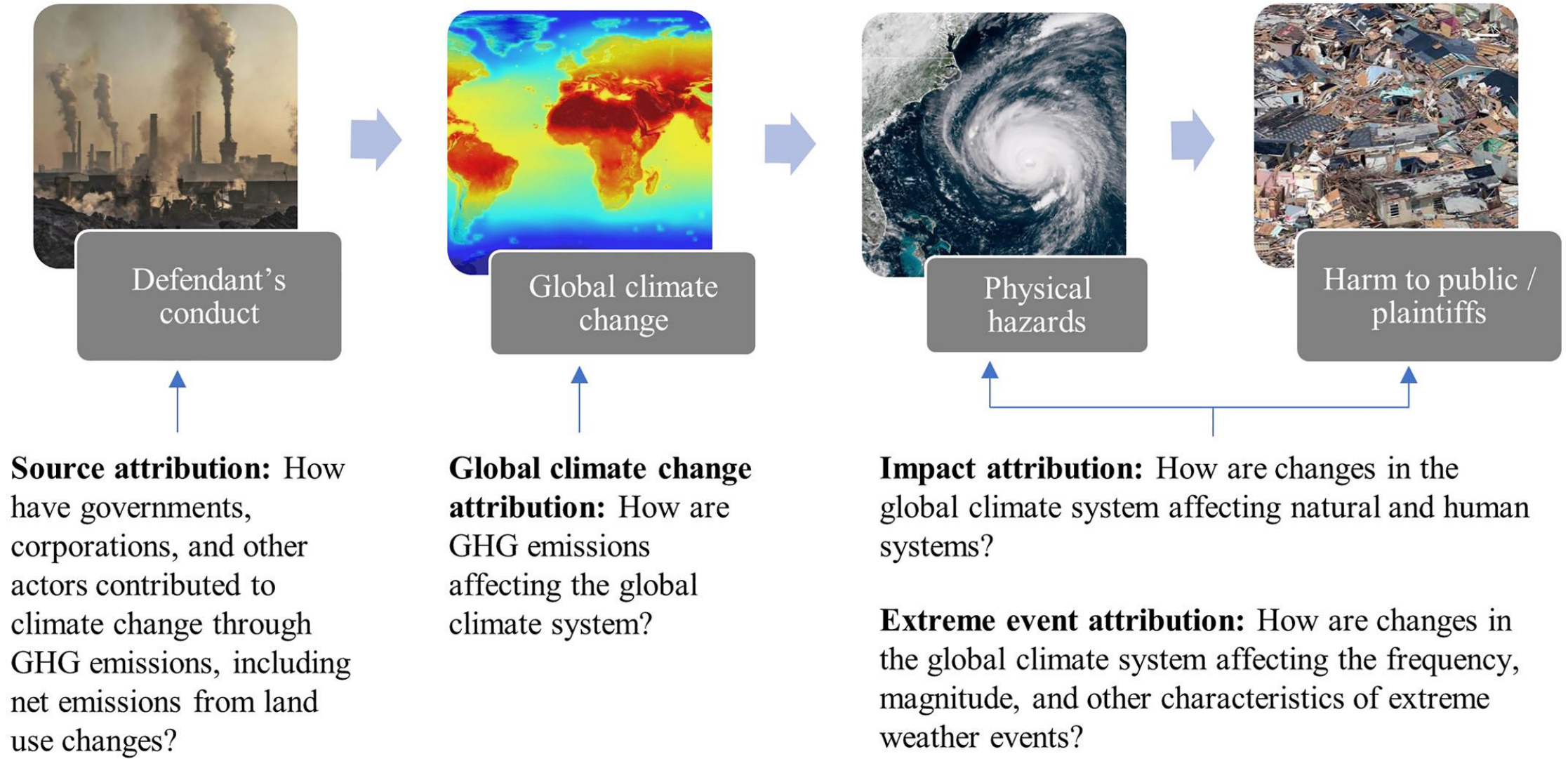
Relevance to international legal efforts

- Constrain timing and magnitude of tipping points and feedback loops
- Implications for intergenerational equity and human rights
- Protection obligations- near-term emissions reductions without overreliance on overshoot



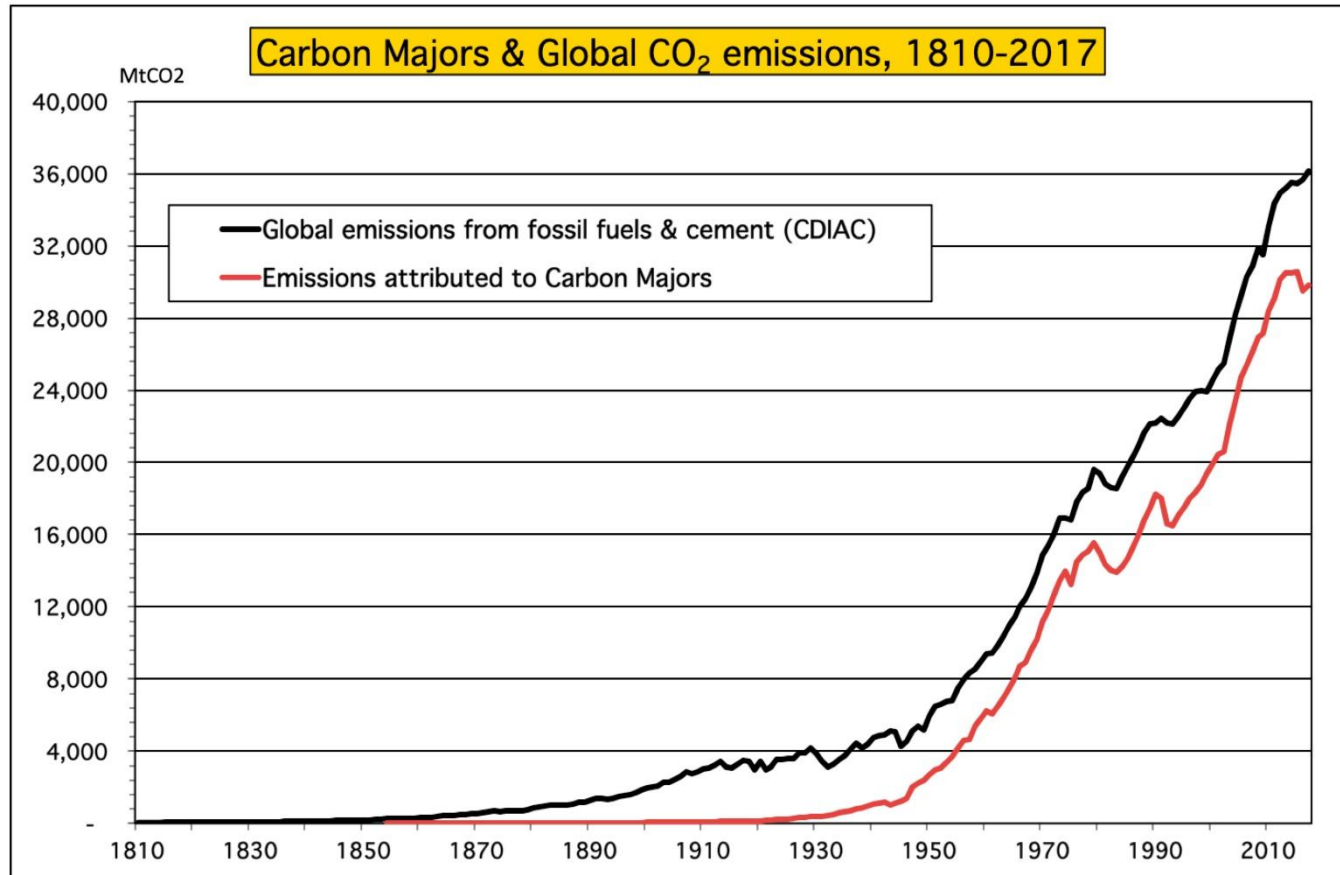
Red line is 30 year rolling mean, Blue line is cumulative Antarctic global mean sea level contribution

Priority research areas to support climate litigation



Attribution to industrial producers

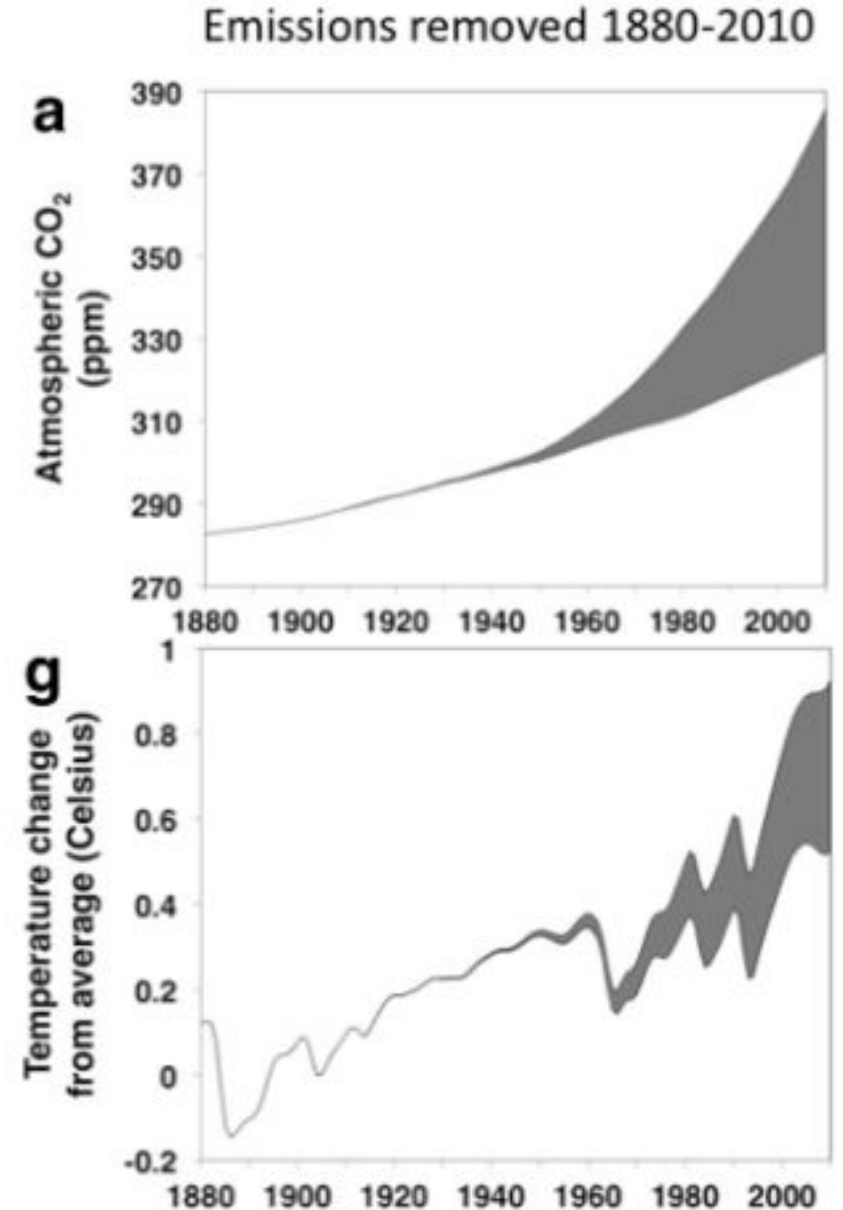
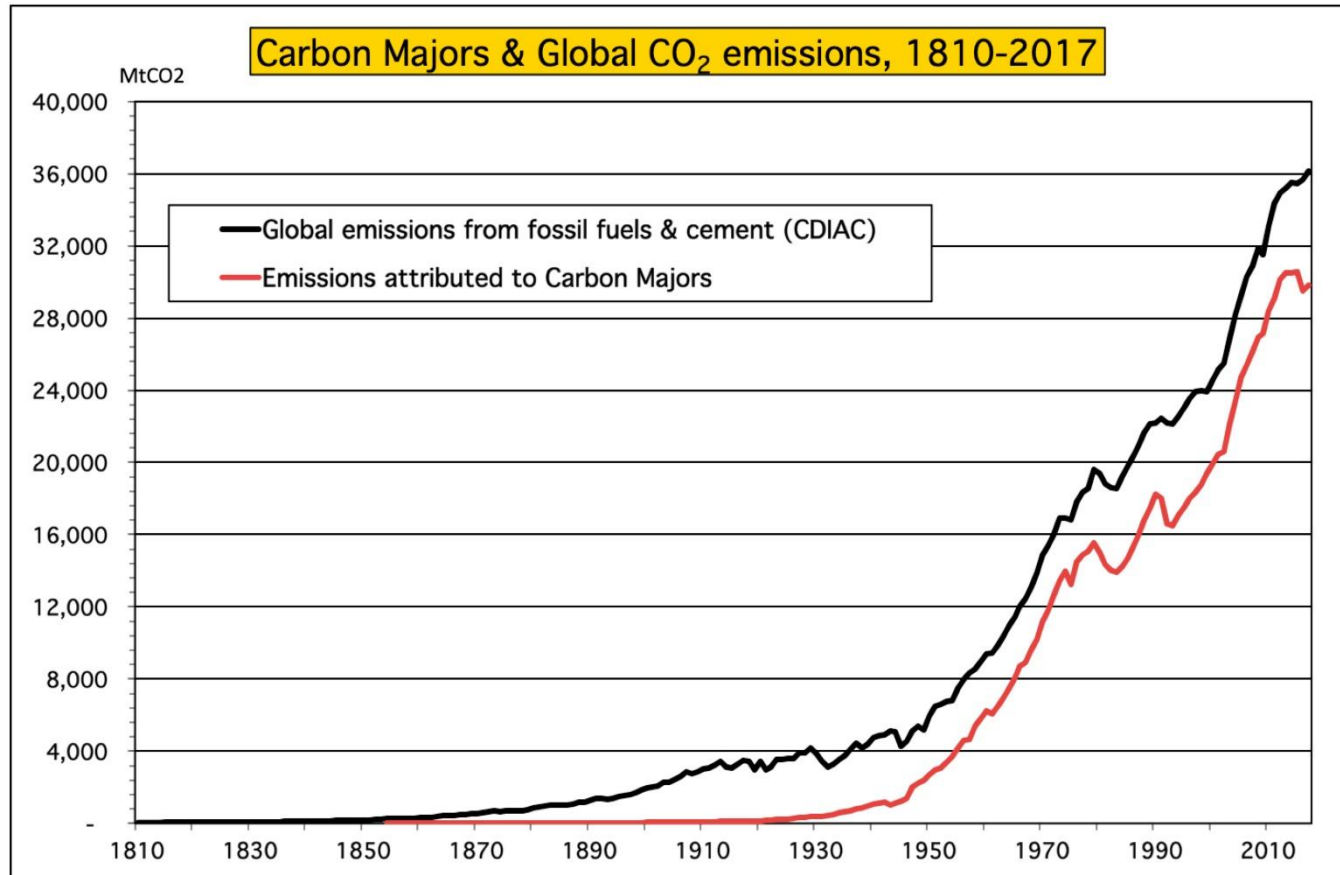
Causal chain: Fossil fuel production \square higher atmospheric greenhouse gas concentrations \square higher global mean temperatures



Left: Climate Accountability Institute; Right: Ekwurzel et al., 2017

Attribution to industrial producers

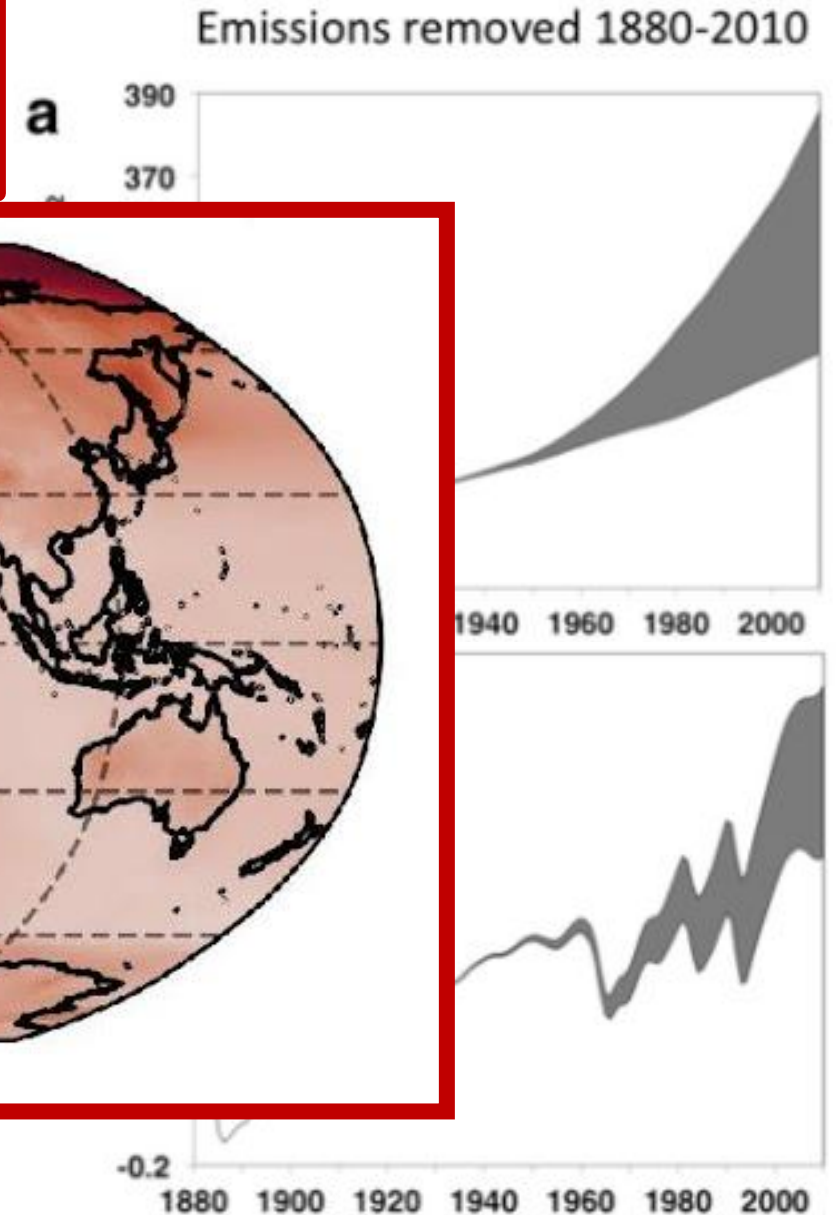
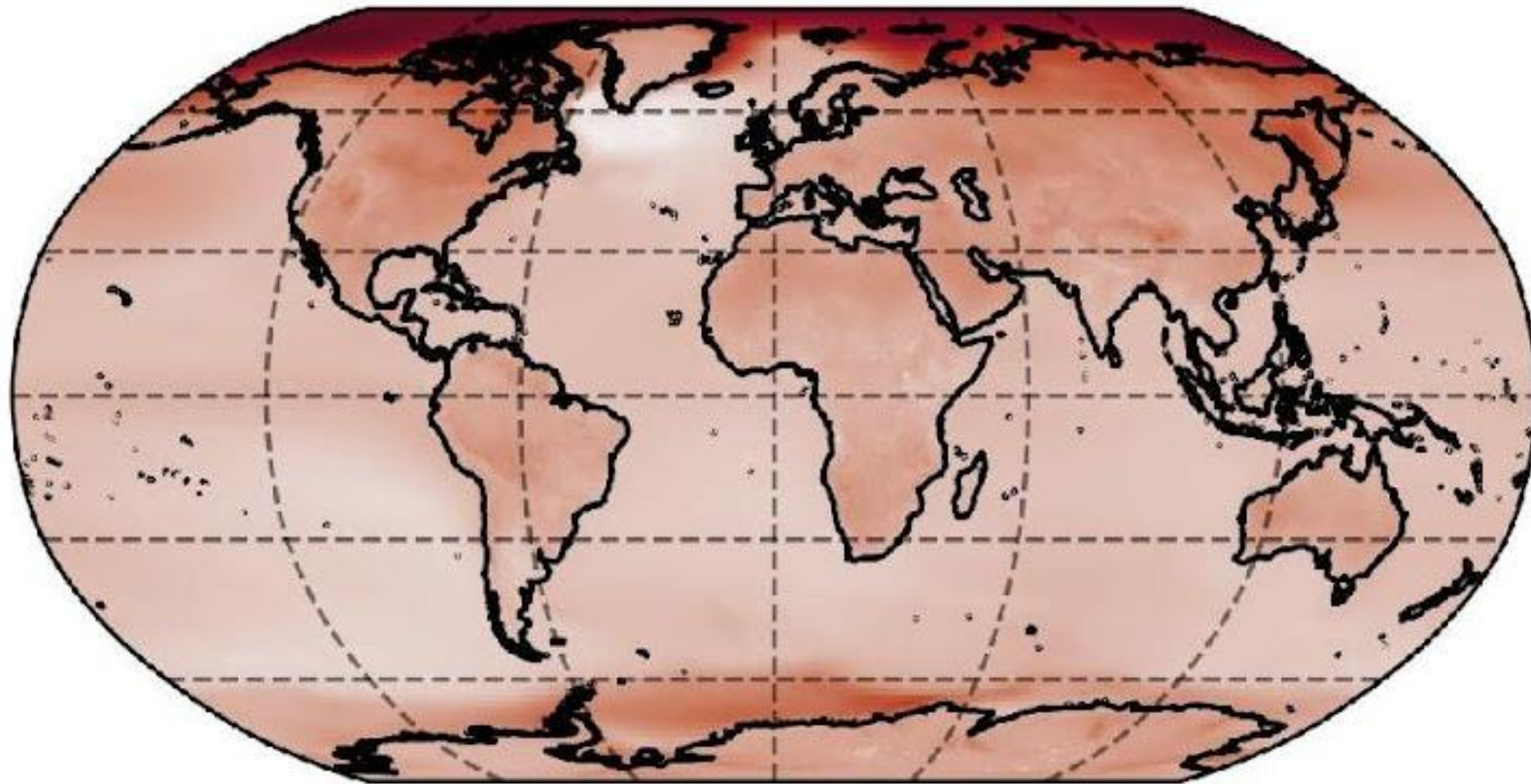
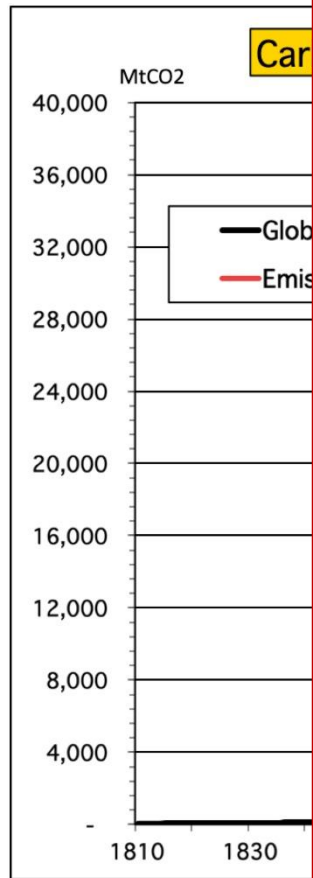
Causal chain: Fossil fuel production \square higher atmospheric greenhouse gas concentrations \square higher global mean temperatures



Left: Climate Accountability Institute; Right: Ekwurzel et al., 2017

Attribution to industrial producers

Next step: moving from the simple climate-carbon cycle parameterizations to including corporate fossil fuel emissions in a fully coupled Earth system model, CESM



Getting involved

Earth system modelers can participate in a variety of ways:

- Lend your expertise to helping write amicus briefs
- Serve as expert witnesses
- Your current work may already be relevant to supporting current and upcoming cases
- Your future work could help fill research gaps

Research on the Record

How Your Expertise Can Hold Climate Polluters Accountable

<https://www.ucsusa.org/resources/research-record>

{ Thank You

No	Amount	In	Out	Disc	Cha
76	45				
356	5678				
4	456				
578	78				
678	9				
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789	4				
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