

RESILIENCE IN THE POLYCRISIS

DRI Canada Symposium
Gatineau QC

Thomas Homer-Dixon
April 11, 2024



The world seems to be going haywire . . .



Okanagan Mountain Park
July 19, 2018



**Wuhan,
China March,
2020**



BC, November 19, 2021

Ukraine, April 2022

824 × 1,026





Pakistan

August 24, 2022

Shahid Saeed Mirza/AFP via Getty Images

Red Sea November 20, 2023

Houthi military media



الإعلام
الحوثي



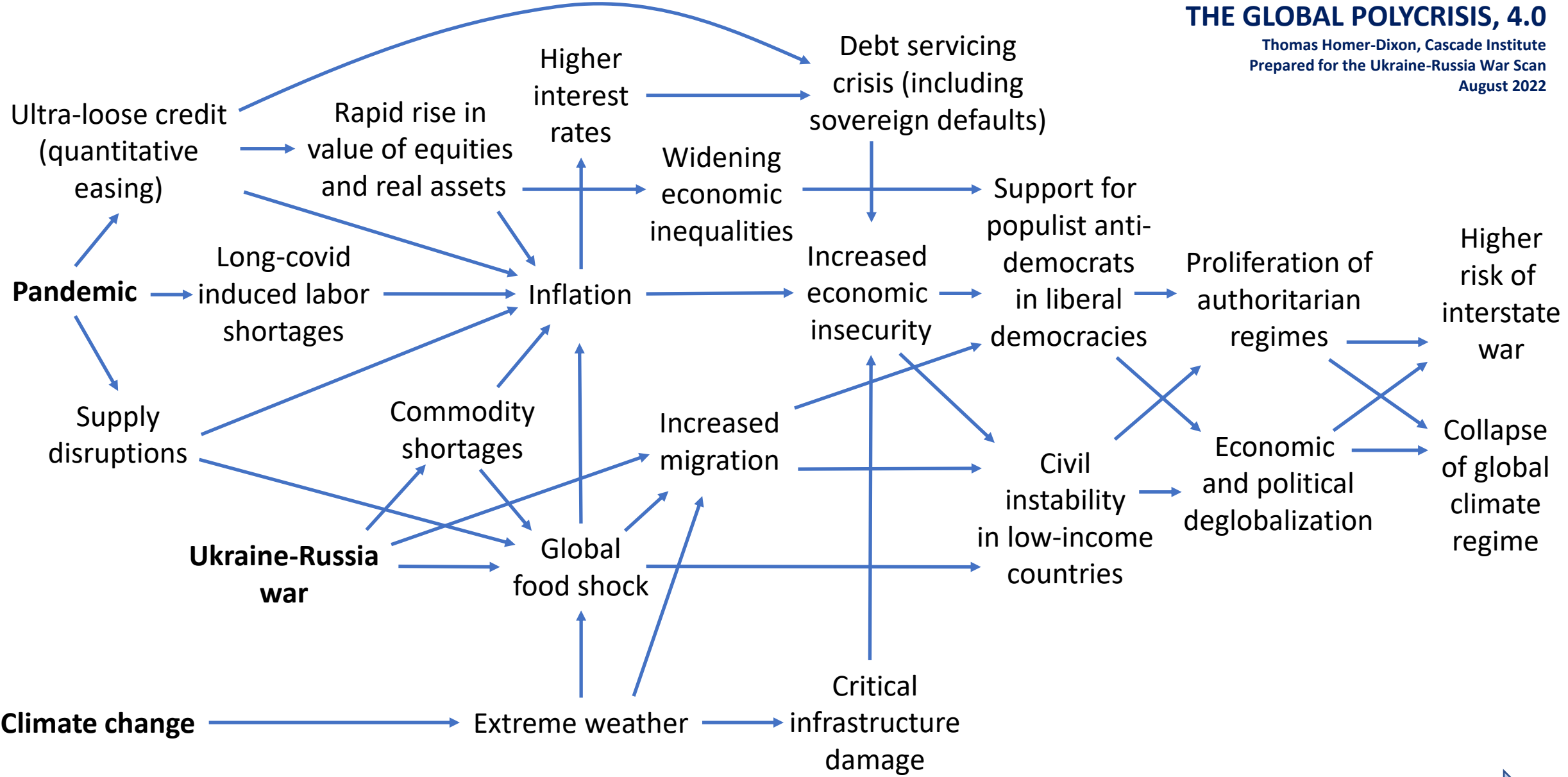
Chiapas, Mexico, January 8, 2024

AP Photo/Edgar H. Clemente

GLOBAL POLYCRISIS

THE GLOBAL POLYCRISIS, 4.0

Thomas Homer-Dixon, Cascade Institute
Prepared for the Ukraine-Russia War Scan
August 2022

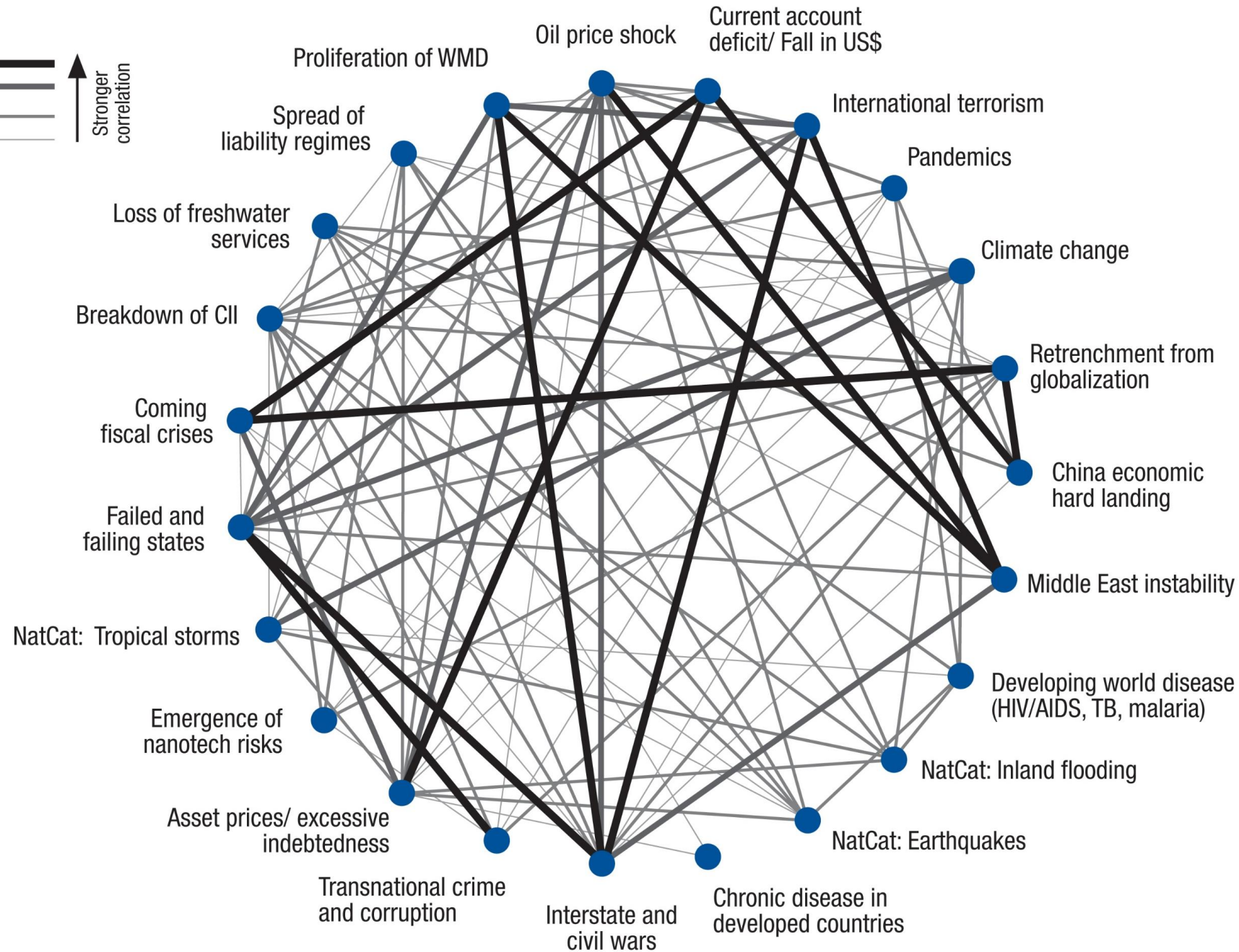


“A **global polycrisis** occurs when crises in multiple global systems become causally entangled in ways that cause major human harm.

When crises interact, they reshape and intensify one another to produce harms both greater than and different than the sum of the harms they would produce separately.”

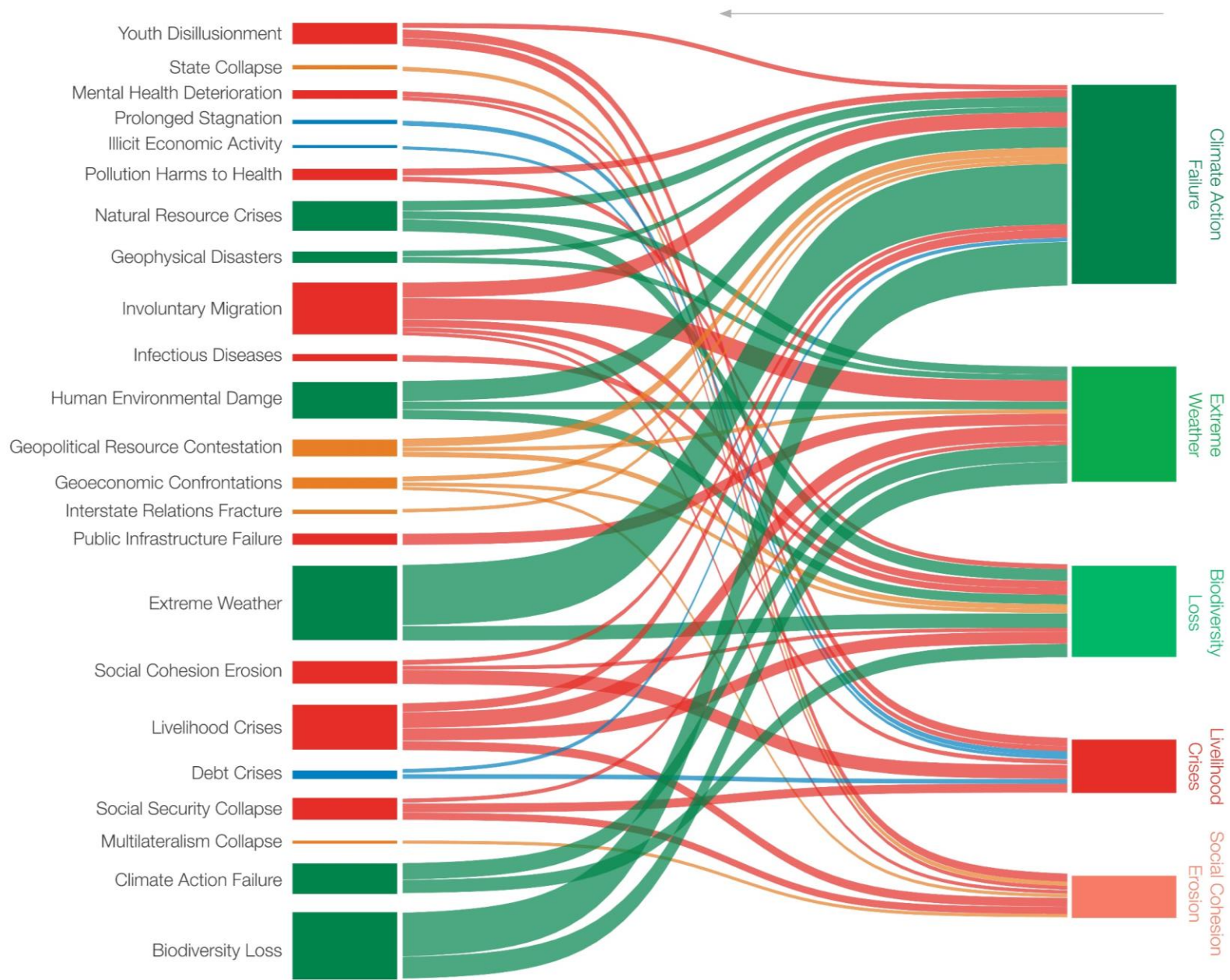
**How do we make sense of
underlying causal
mechanisms?**

Key:



The Correlation Matrix

“It is a central tenet of work conducted by the Global Risk Network that global risks do not manifest themselves in isolation: their drivers, triggers and consequences interconnect” (p. 13).



Global Risk Effects

Global Risks Report
2022

(from p. 26; diagram has been rotated)

■ Economic
 ■ Environmental
 ■ Geopolitical
 ■ Societal
 ■ Technological

Cascade Institute approach





[Global Sustainability](#)

Accepted manuscript

Global Polycrisis: The Causal Mechanisms of Crisis Entanglement

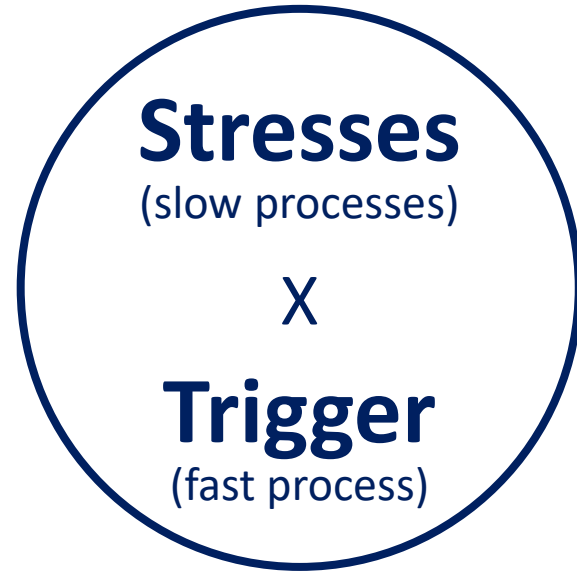
Published online by Cambridge University Press: **17 January 2024**

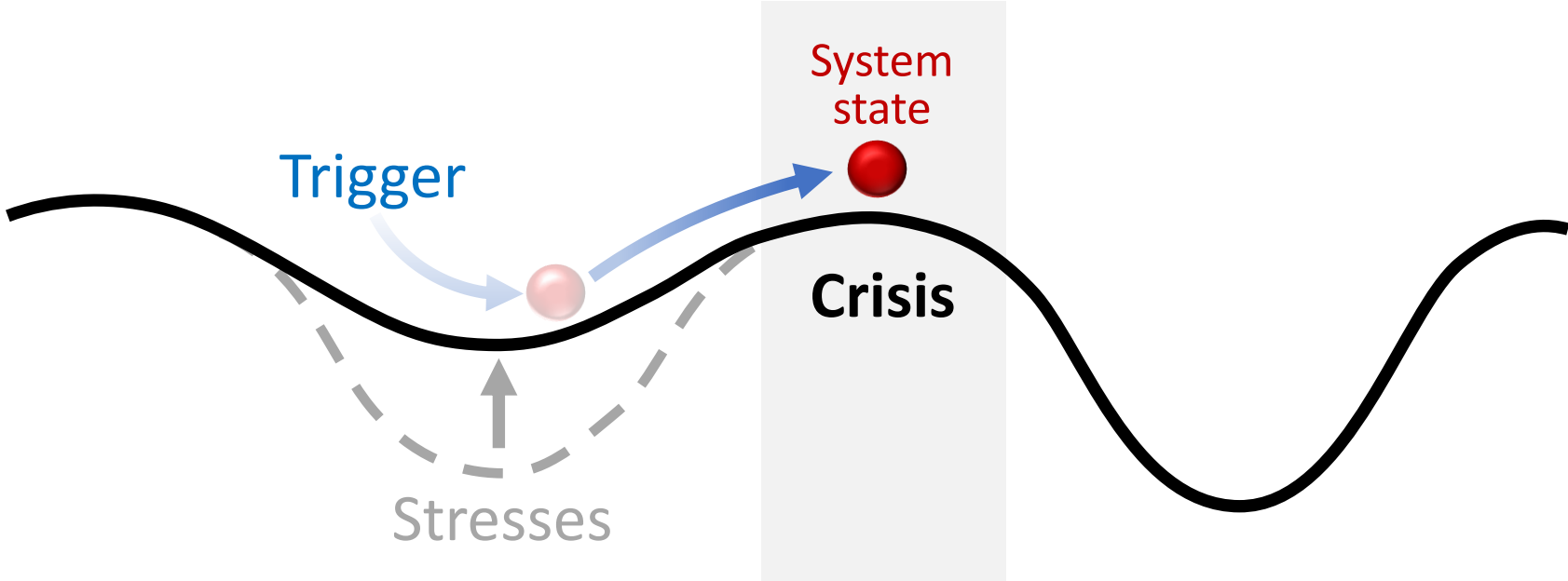
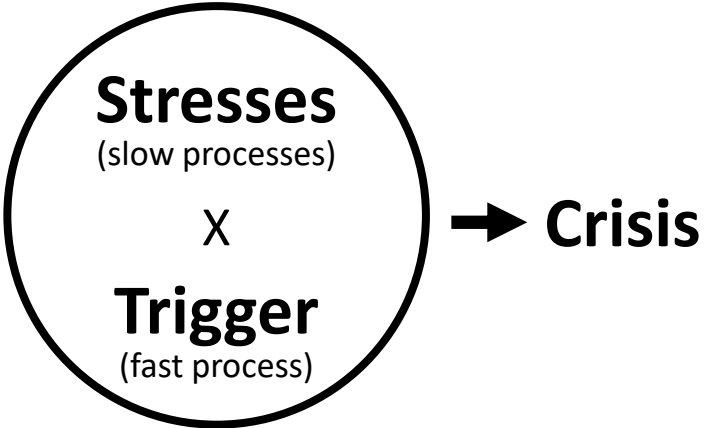
Michael Lawrence , Thomas Homer-Dixon, Scott Janzwood, Johan Rockstöm, Ortwin Renn and Jonathan F. Donges

[Show author details](#) 

Article

Metrics





Stresses include

1. climate heating
2. biodiversity decline
3. zoonotic viral diseases, microbial resistance
4. demographic divergence, population aging
5. high uniformity and connectivity of global food supply
6. declining power density of energy sources
7. high uniformity and connectivity of global financial system
8. slowing economic growth, widening economic inequalities
9. ideological polarization and political gridlock
10. propagation of large language model AI
11. great-power hegemonic transition

Global stresses
and the crises they cause are

amplifying,

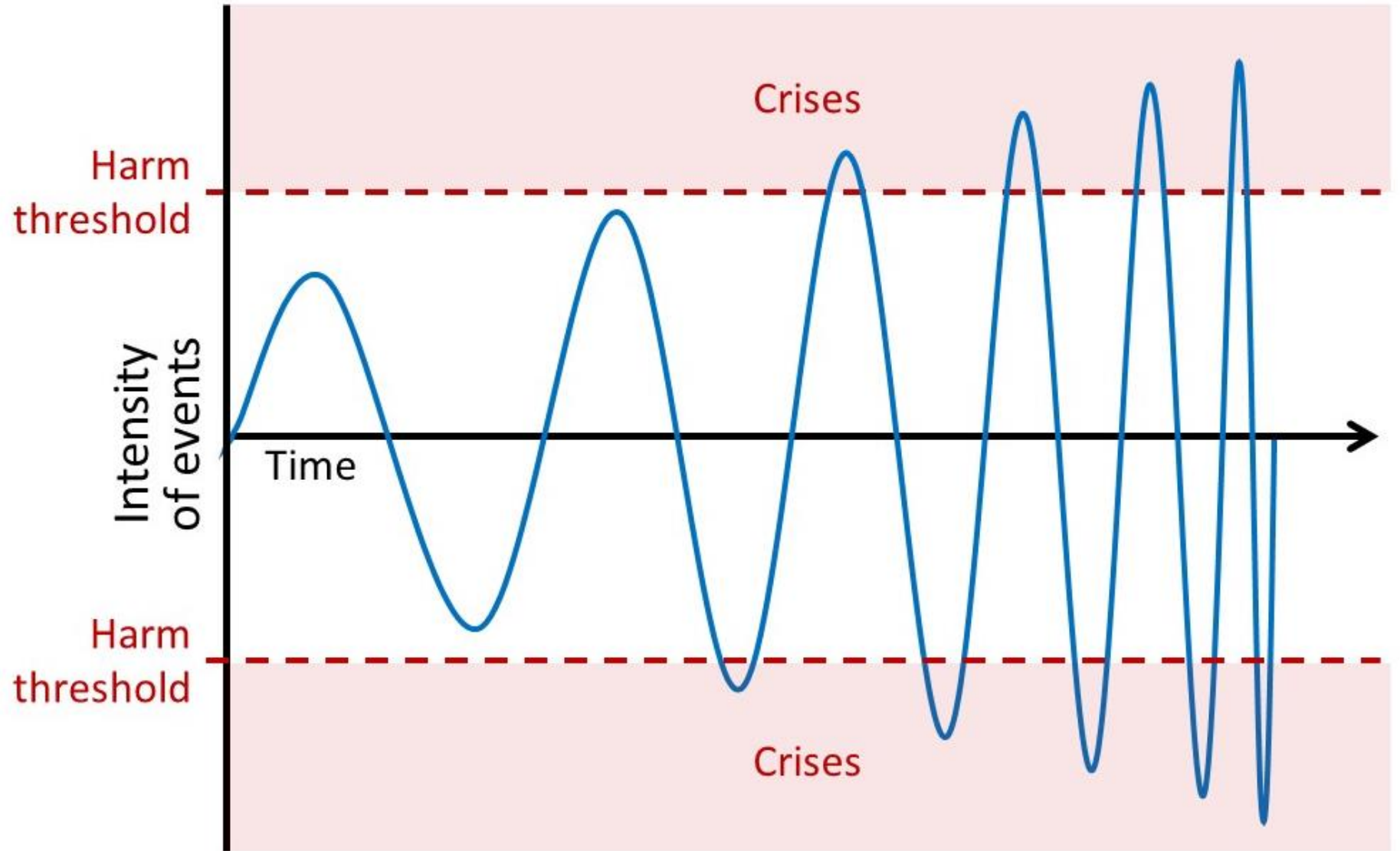
accelerating,

and

synchronizing.

Amplification and acceleration

Michael Lawrence, 2023



HIV 1980, SARS 2002, H1N1 2009, MERS 2012, Ebola 2014, Zika 2015, Ebola 2018, COVID-19 2019, monkeypox 2021.



OXFORD

Oxford Open Climate Change, 2023, **3(1)**, kgad008

<https://doi.org/10.1093/oxfclm/kgad008>

Perspective article

Global warming in the pipeline

James E. Hansen^{1*}, Makiko Sato¹, Leon Simons², Larissa S. Nazarenko^{3,4}, Isabelle Sangha¹, Pushker Kharecha¹, James C. Zachos⁵, Karina von Schuckmann⁶, Norman G. Loeb⁷, Matthew B. Osman⁸, Qinjian Jin⁹, George Tselioudis³, Eunbi Jeong¹⁰, Andrew Lacis³, Reto Ruedy^{3,11}, Gary Russell³, Junji Cao¹², Jing Li¹³

¹*Climatic Science, Assessment and Solutions, Columbia University Earth Institute, New York, NY, USA*

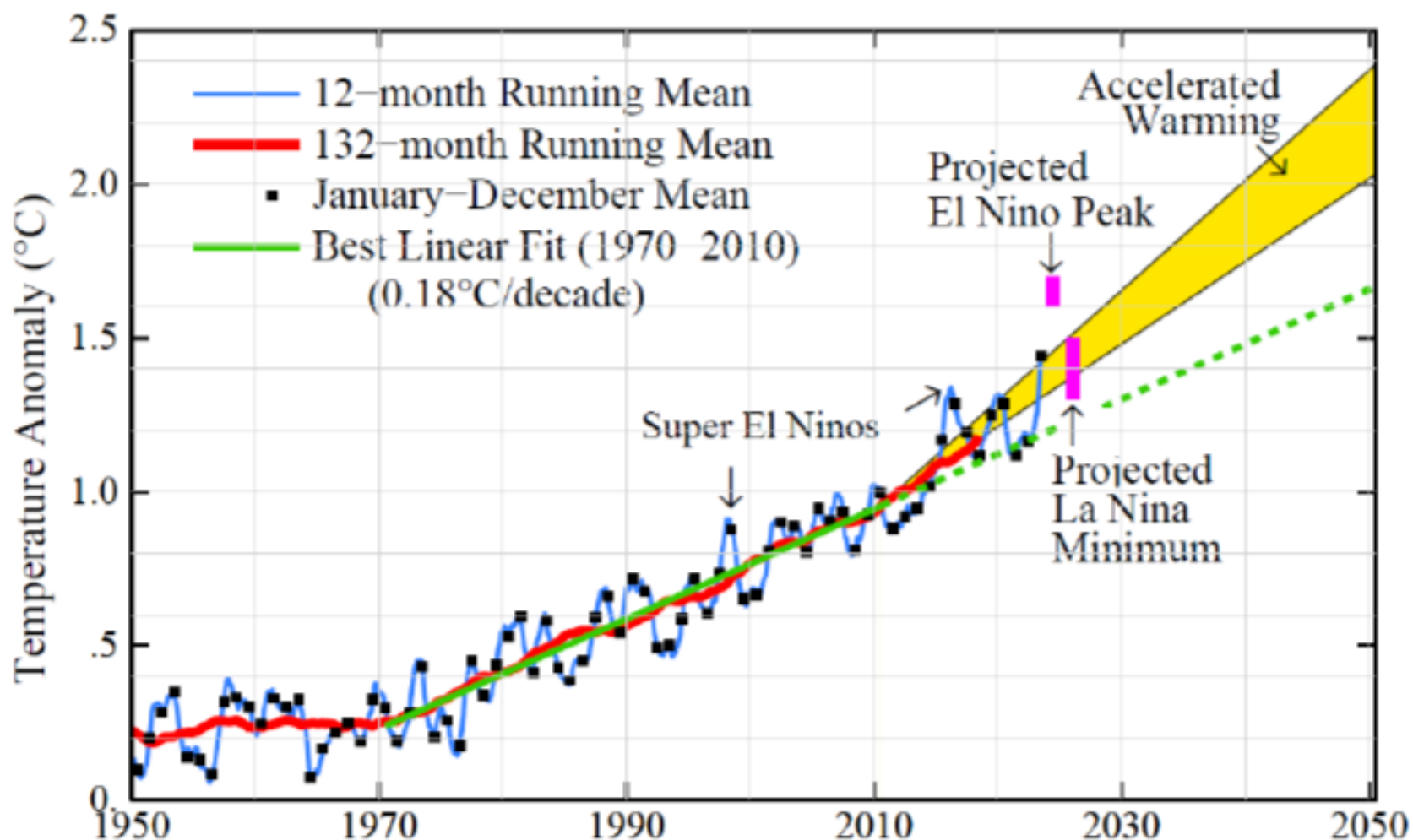
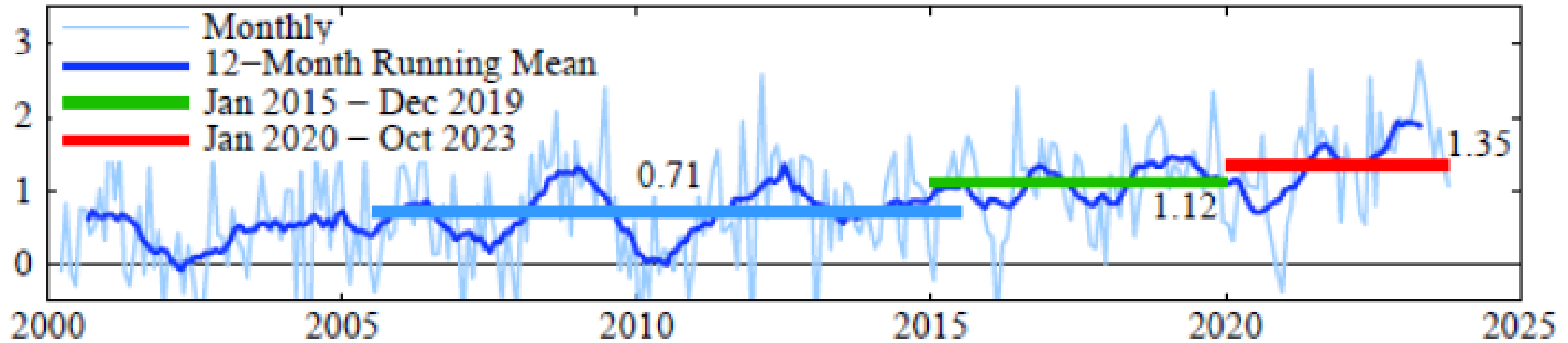
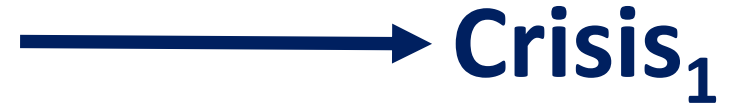
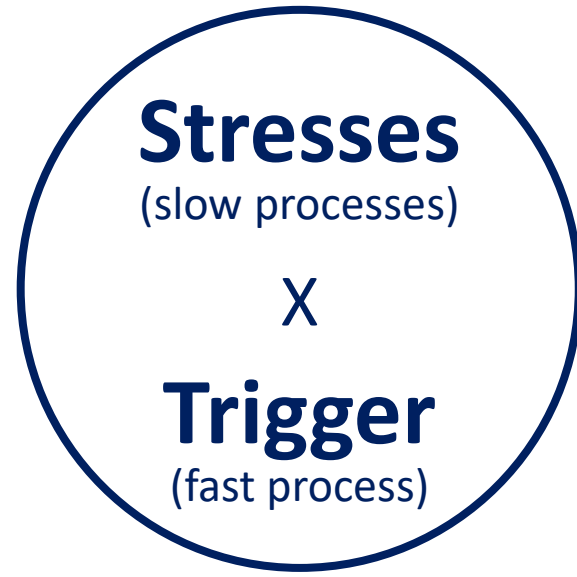


Fig. 6. Global temperature relative to 1880-1920 based on the GISS analysis.^{1,2} Projected El Nino warming and La Nina cooling discusses in text and decadal acceleration in *Pipeline*.³

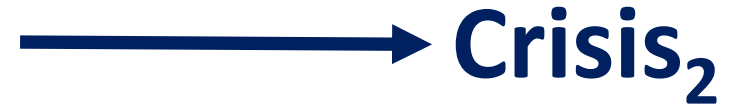
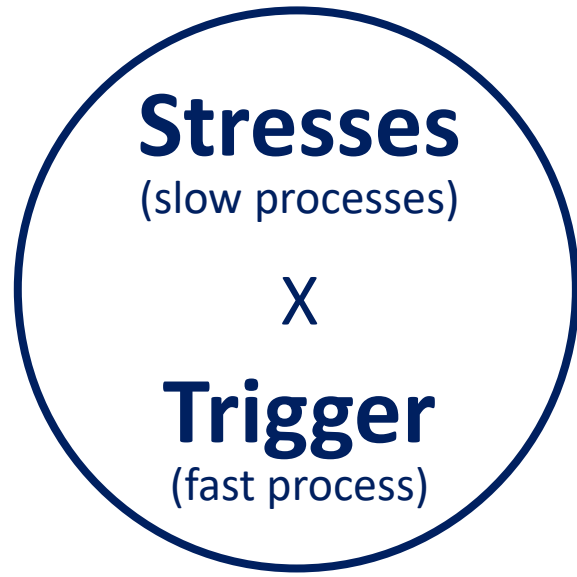
Earth's Energy Imbalance (W/m^2)



System 1



System 2



Synchronization

System 1:
Human-viral
ecology



Pandemic

Synchronization

System 1:
Human-viral
ecology



Pandemic

System 2:
Healthcare



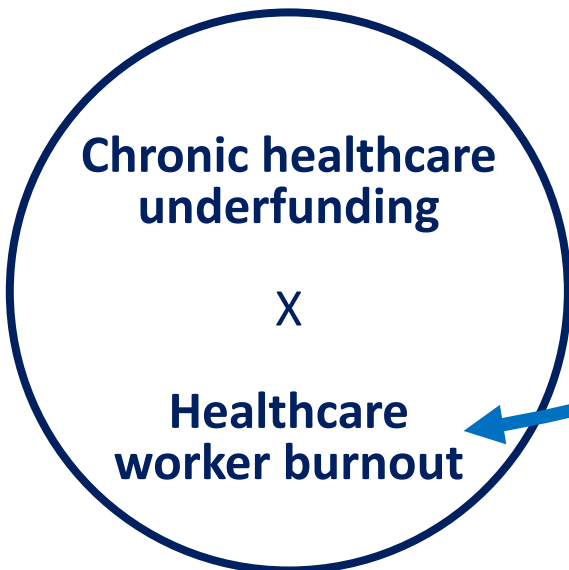
Synchronization

System 1:
Human-viral
ecology



Pandemic

System 2:
Healthcare



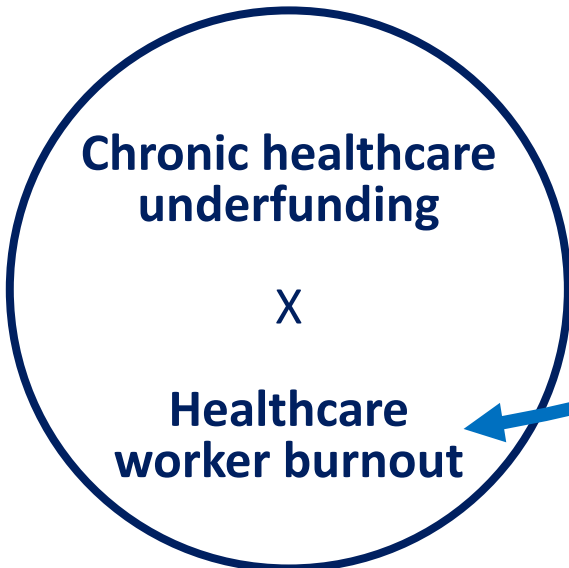
Synchronization

System 1:
Human-viral
ecology

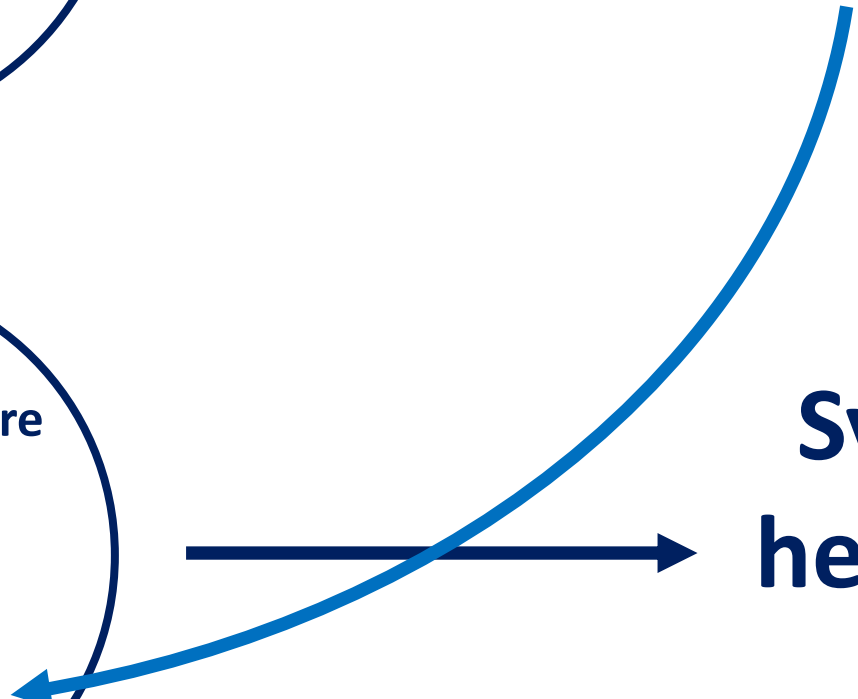


Pandemic

System 2:
Healthcare



**Systemic
healthcare
crisis**



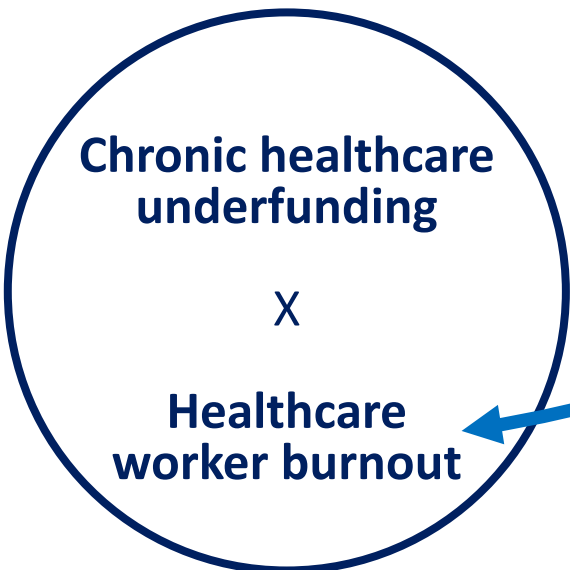
Synchronization

System 1:
Human-viral
ecology



Pandemic

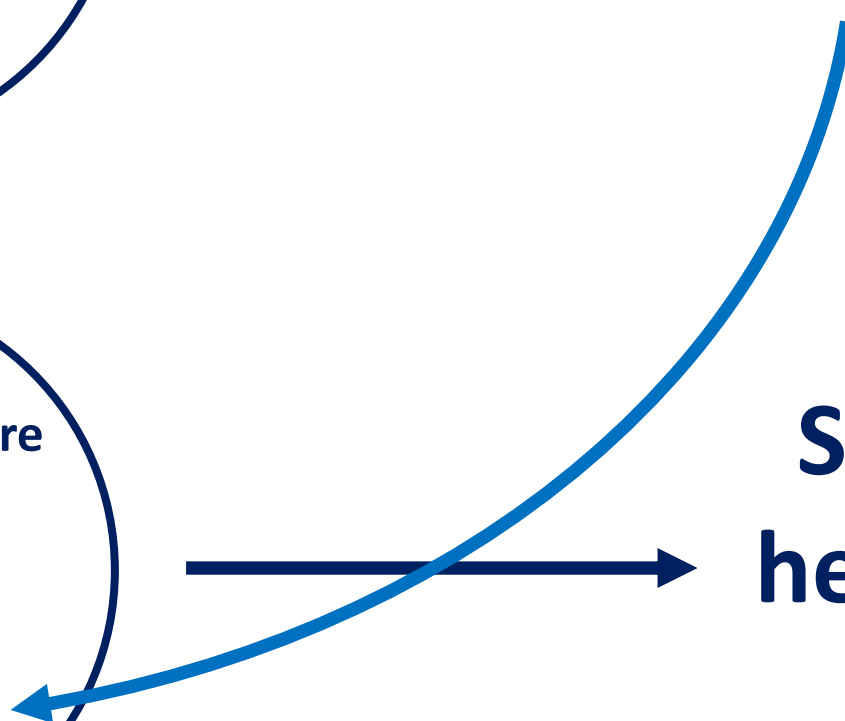
System 2:
Healthcare



**Systemic
healthcare
crisis**



Synchronization



What should
we do?

BUILD RESILIENCE

**Resilient people, businesses,
and societies can better withstand
shock without catastrophic failure,
have the capacity for self-reliance,
and are creative in response to novel
challenges.**

ENGINEERING RESILIENCE

Bouncing back to the status quo

is distinct from

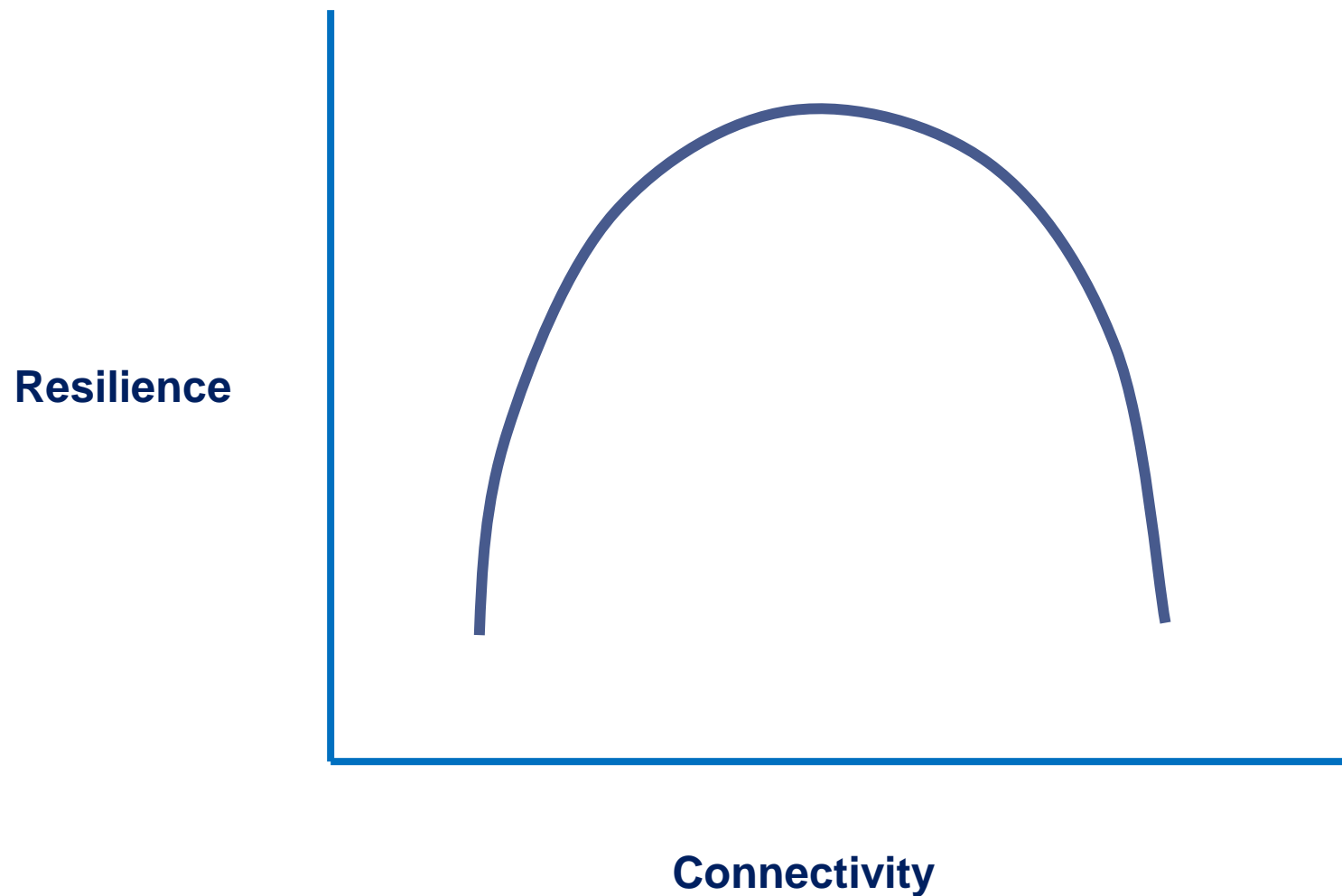
ECOLOGICAL RESILIENCE

Adaptation through deep structural change

**We can increase
ENGINEERING RESILIENCE
(bouncing back)
by**

- ***Loosening coupling in key systems***
(reducing connectivity and boosting redundancy of key internal components)
- ***Diversifying sources of, and increasing self-sufficiency in, critical inputs***

Connectivity and Resilience



ENGINEERING RESILIENCE

(bouncing back)

- **turns mess into order**
- **comes mostly from the top
(centralized problem solving)**
- **uses technical expertise**
- **doesn't challenge the power and
privilege of status-quo interests
(so is politically conservative)**

**We can increase
ECOLOGICAL RESILIENCE
(adaptation through structural change)
by**

- ***Decentralizing* problem solving**
- **Boosting the rate of *safe-fail experimentation***
- **Planning in advance for *political action* when
shock occurs**

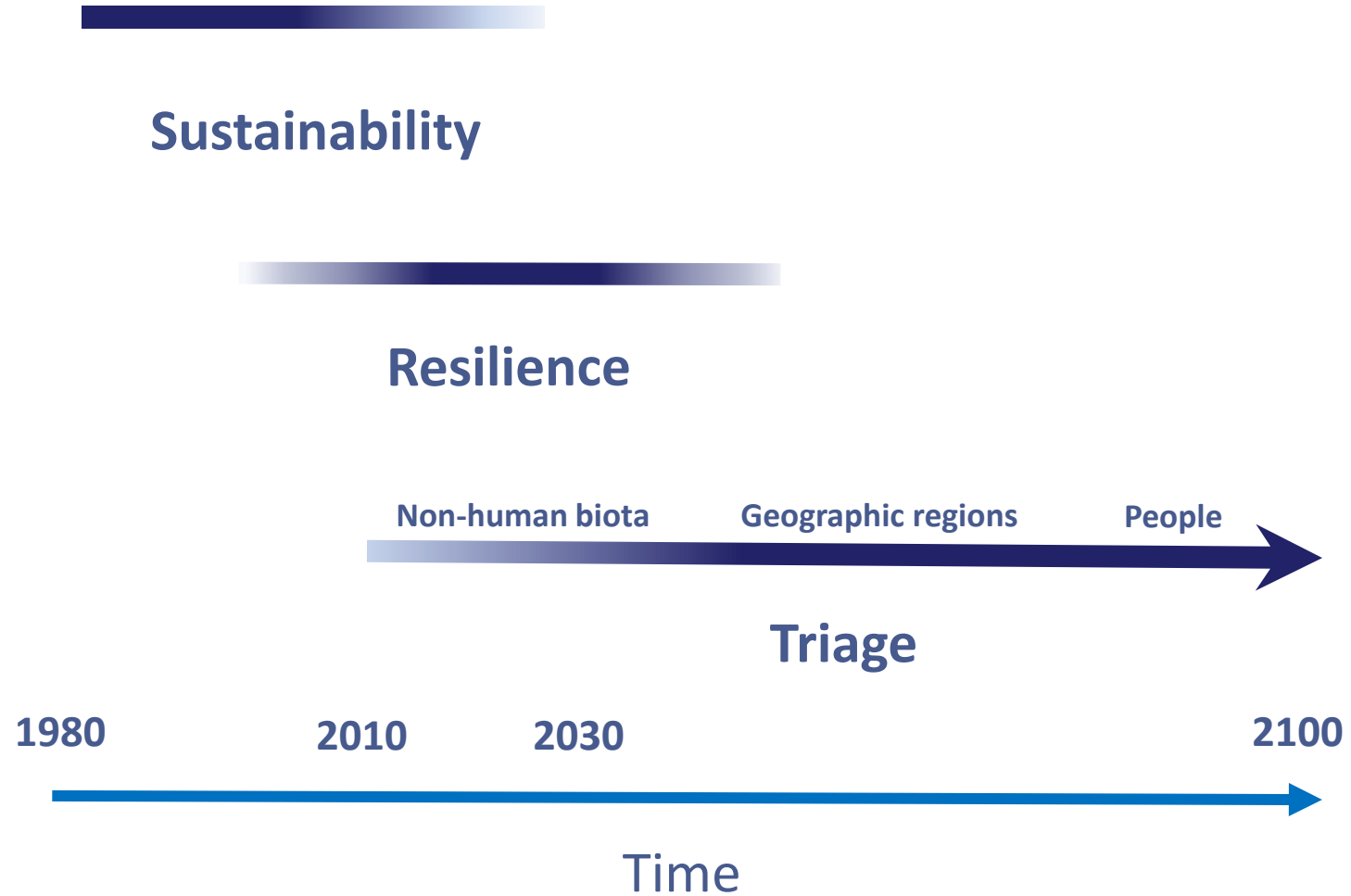
ECOLOGICAL RESILIENCE

- **turns mess into creativity**
- **comes mostly from the middle and bottom (distributed problem solving)**
- **use experiential and tacit knowledge**
- **challenges status-quo power and privilege (so is politically radical)**

RESILIENCE ISN'T EVERYTHING

It may buy us time, but it doesn't
address the underlying drivers of
the global polycrisis

FROM SUSTAINABILITY TO TRIAGE



FROM SUSTAINABILITY TO TRIAGE



THE CORE OF RESILIENCE

**A commitment to the commonweal
across political, ideological, and
economic divisions**

**A shared sense of “we” that defines
a projet de société
that encompasses all the region’s
people, across space and time.**

We

Thank you

What does this
mean?

**Amplifying, accelerating, and synchronizing crises
mean that**

we're moving from a world of

RISK

to a world of

UNCERTAINTY

(unknown unknowns)

Symposium:

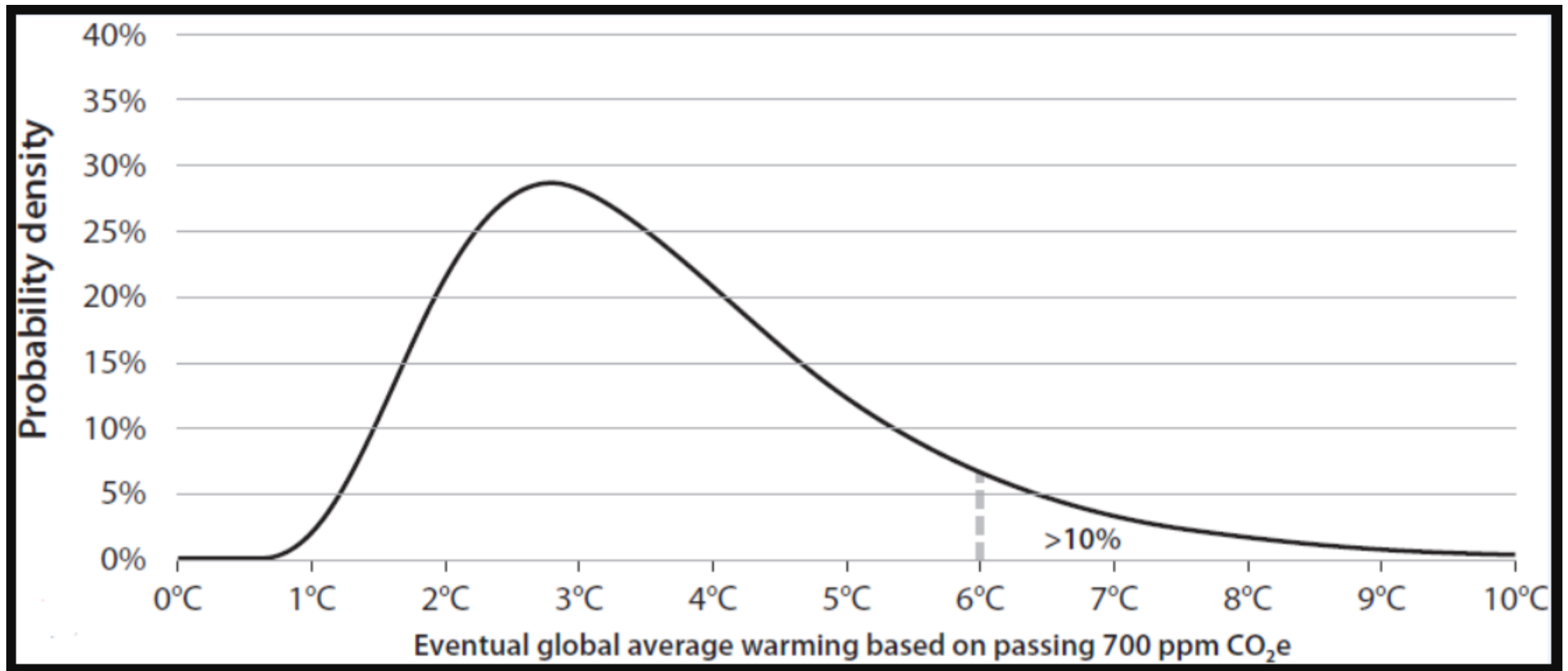
Fat Tails and the Economics of Climate Change

**Fat-Tailed Uncertainty in the
Economics of Catastrophic Climate
Change**

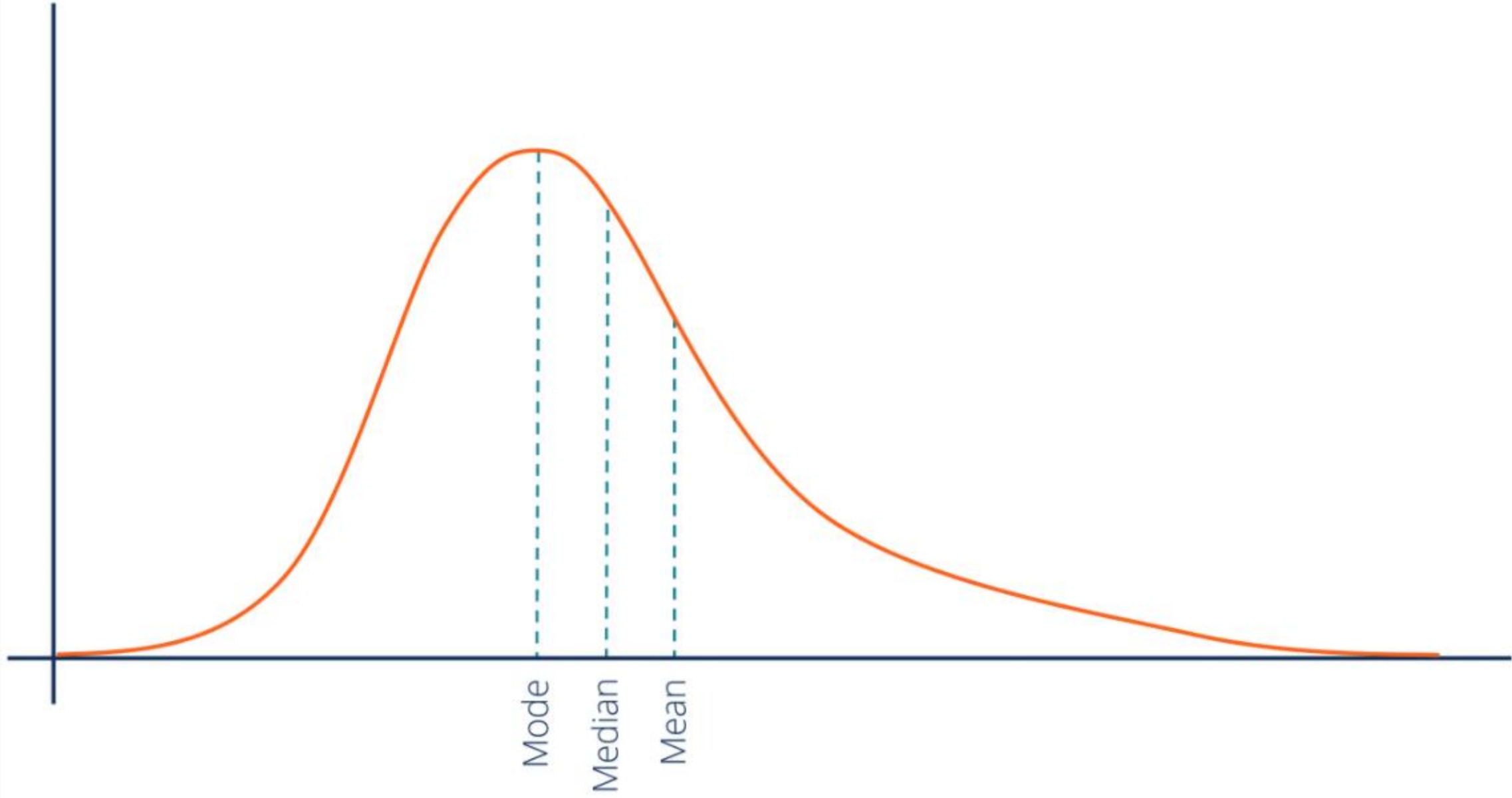
Martin L. Weitzman*

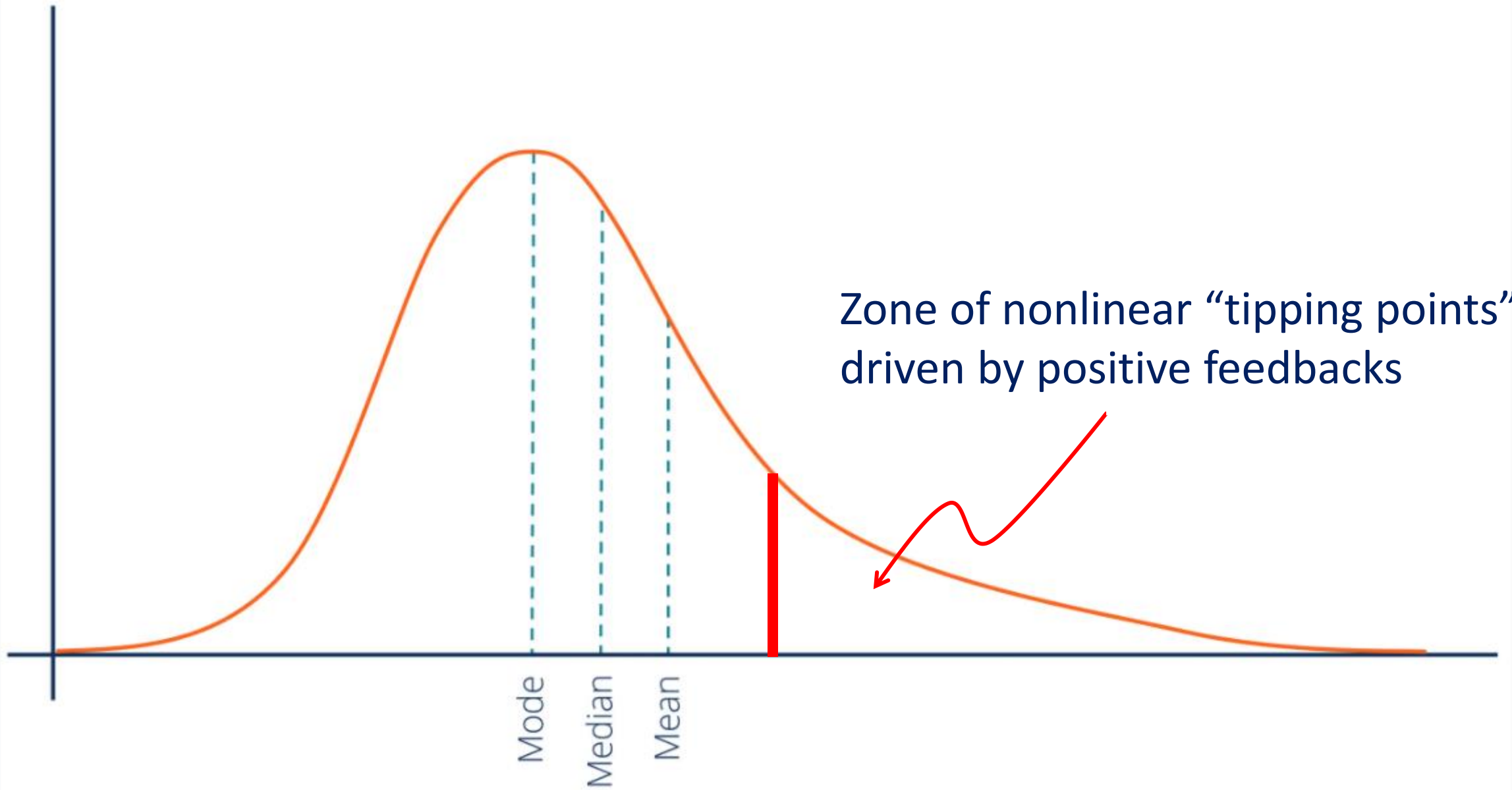
“I believe that the most striking feature of the economics of climate change is that its extreme downside is nonnegligible. Deep structural uncertainty about the unknown unknowns of what might go very wrong is coupled with essentially unlimited downside liability on possible planetary damages. This is a recipe for producing what are called “fat tails” in the extremes of critical probability distributions. . . . It is difficult to judge how fat the tail of catastrophic climate change might be because it represents events that are very far outside the realm of ordinary experience.”

Martin Weitzman, 2011, “Fat-Tailed Uncertainty in the Economics of Catastrophic Climate Change,” *Review of Environmental Economics and Policy*.



Wagner and Weitzman, *Climate Shock*, 2017





Zone of nonlinear "tipping points"
driven by positive feedbacks



Global Tipping Points

Summary Report 2023

Led by:



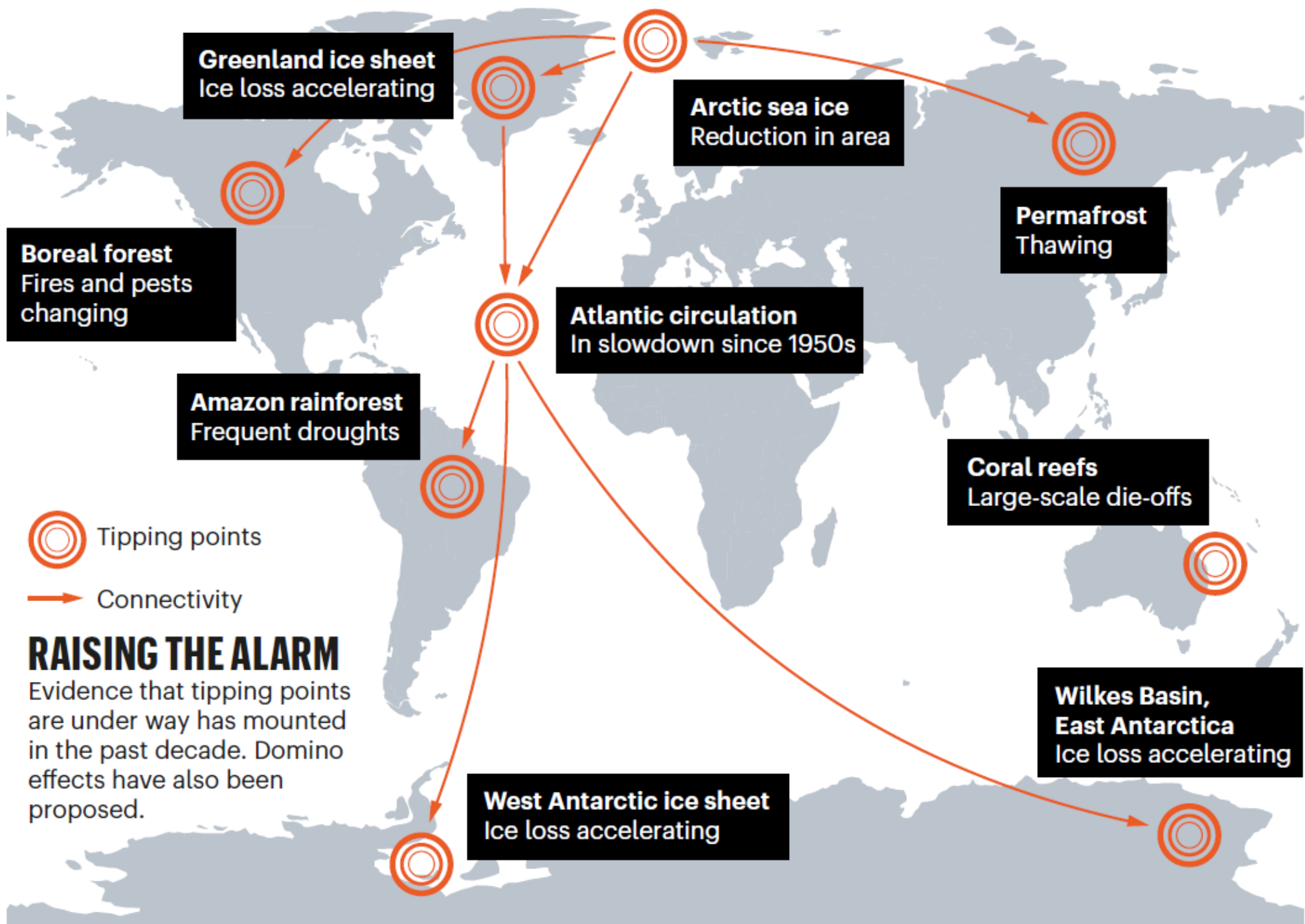
University
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Global Systems
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FUND



RAISING THE ALARM

Evidence that tipping points are under way has mounted in the past decade. Domino effects have also been proposed.