

Global reflections – the complexity of the outlook for production and conservation in forested landscapes – navigating risk, competing values and irrationality

Peter Cochrane

Our planet as a system - drivers



- Solar radiation input and re-radiation
- Elliptical orbit and rotation – seasonal and diurnal fluctuations
- Rotation – Coriolis effect – driving ocean currents and wind, redistributing heat
- Moon and sun – tides
- The biosphere - CO_2 and O_2 exchange
- A planet of rhythms and cycles
- Infrequent dramatic perturbations (meteors, vulcanism, earthquakes, tsunamis) and much slower continental drift

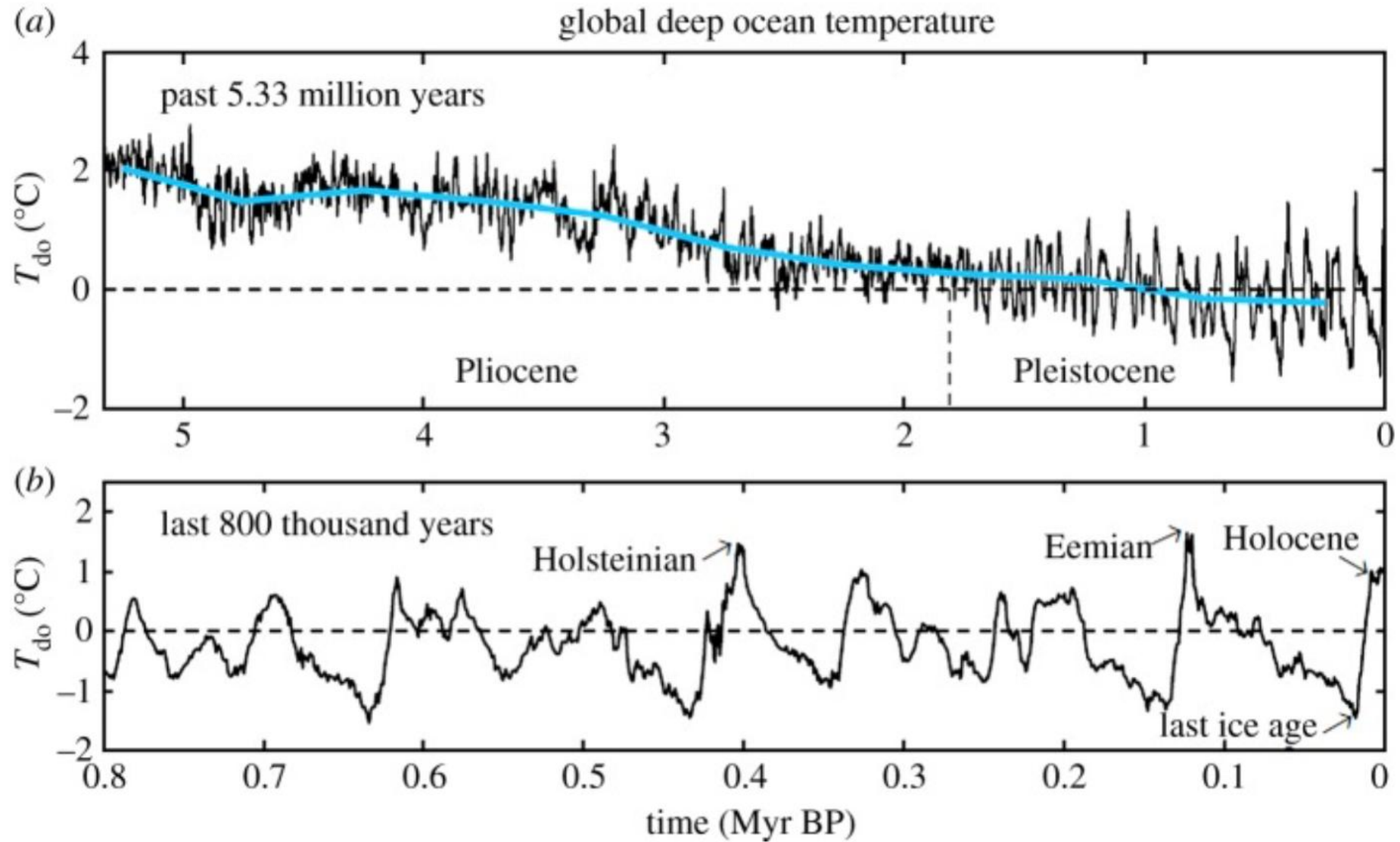
Our planet as a system - stabilisers



- Atmosphere – insulation and filtering
- Biosphere - absorbing heat; CO_2 - O_2 exchange; C cycling
- Oceans –absorbing heat and distributing it; absorbing CO_2 and releasing O_2
- Hydrological and climate cycles – collecting and distributing heat and water
- Polar ice caps – storing water, reflecting heat
- Biogeochemical cycles – redistributing nutrients and minerals

Pleistocene (2.6m -11,700 years ago)

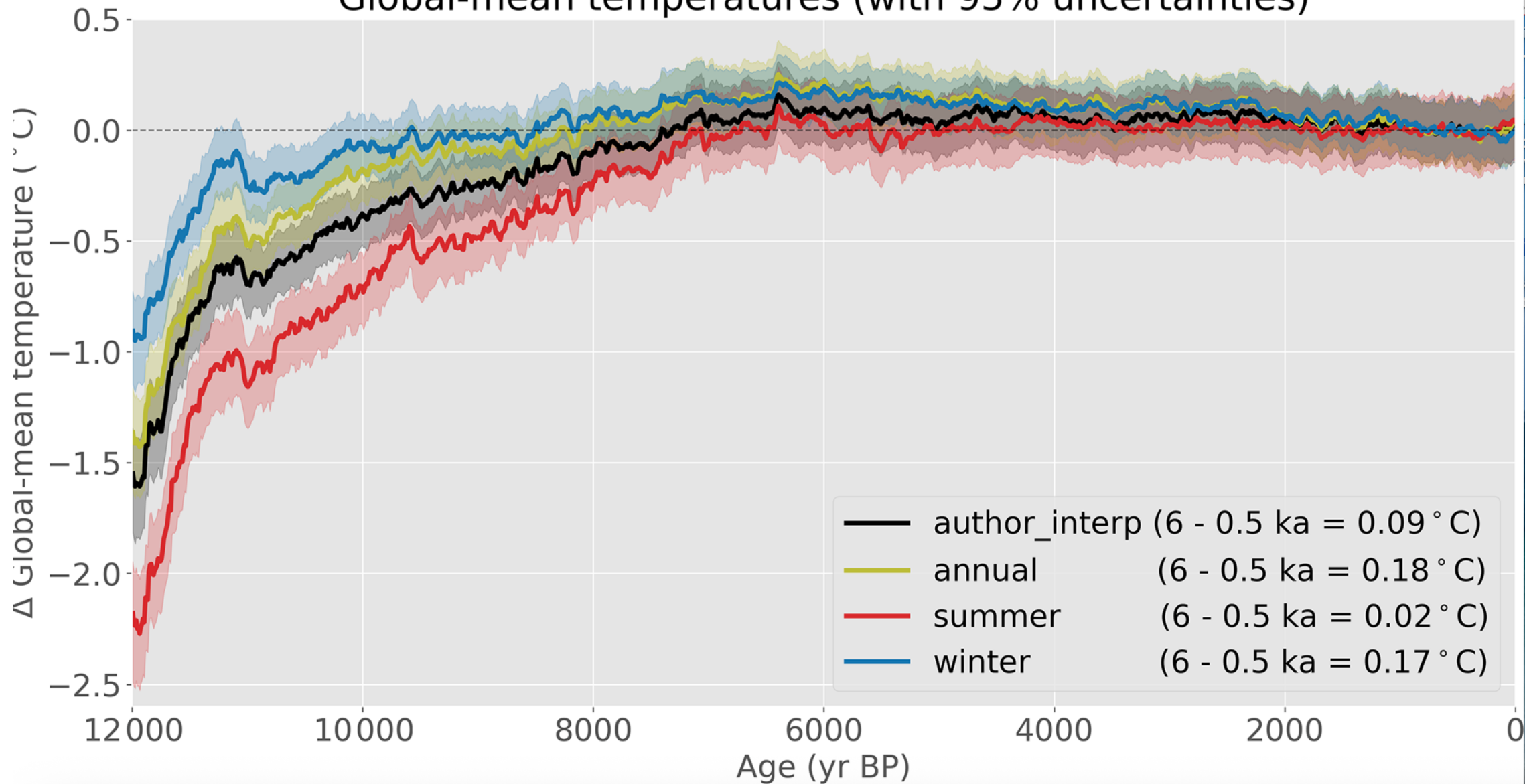
- Highly variable climate, especially temperature
- Oscillating glacial cycles (glacial and interglacial periods)
- Sea levels up to 120 metres below current
- Emergence of early humans and by around 100,000 years widespread colonization
- Around 30-50,000 years ago – many species of megafauna disappeared



Deep ocean temperature in (a) the Pliocene and Pleistocene and (b) the last 800 000 years. High-frequency variations (black) are five-point running means of the original data [4], whereas the blue curve has a 500 kyr resolution. The deep ocean temperature for the entire Cenozoic era is in figure 1b.

Seasonality sensitivity experiments

Global-mean temperatures (with 95% uncertainties)

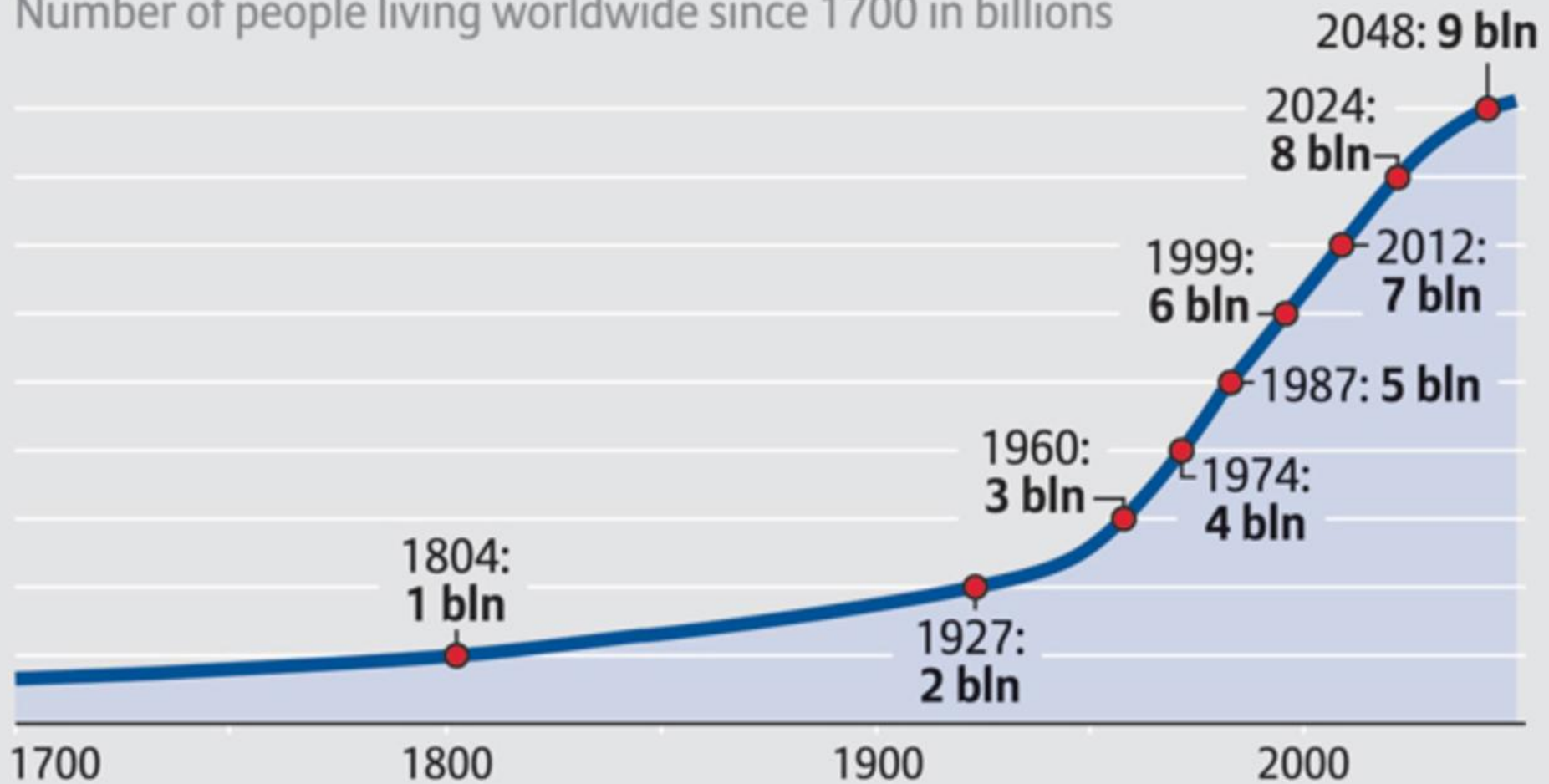


Holocene – 11,000 – years ago - present

- climate- relatively stable
- enabling emergence of agriculture, human settlements
- domestication of plants and animals for human purposes
- modifying landscapes
- gradual intensification of natural resource use over thousands of years
- accelerating dramatically over the last two centuries with fossil fuel use, industrialisation and technology

POPULATION OF THE EARTH

Number of people living worldwide since 1700 in billions

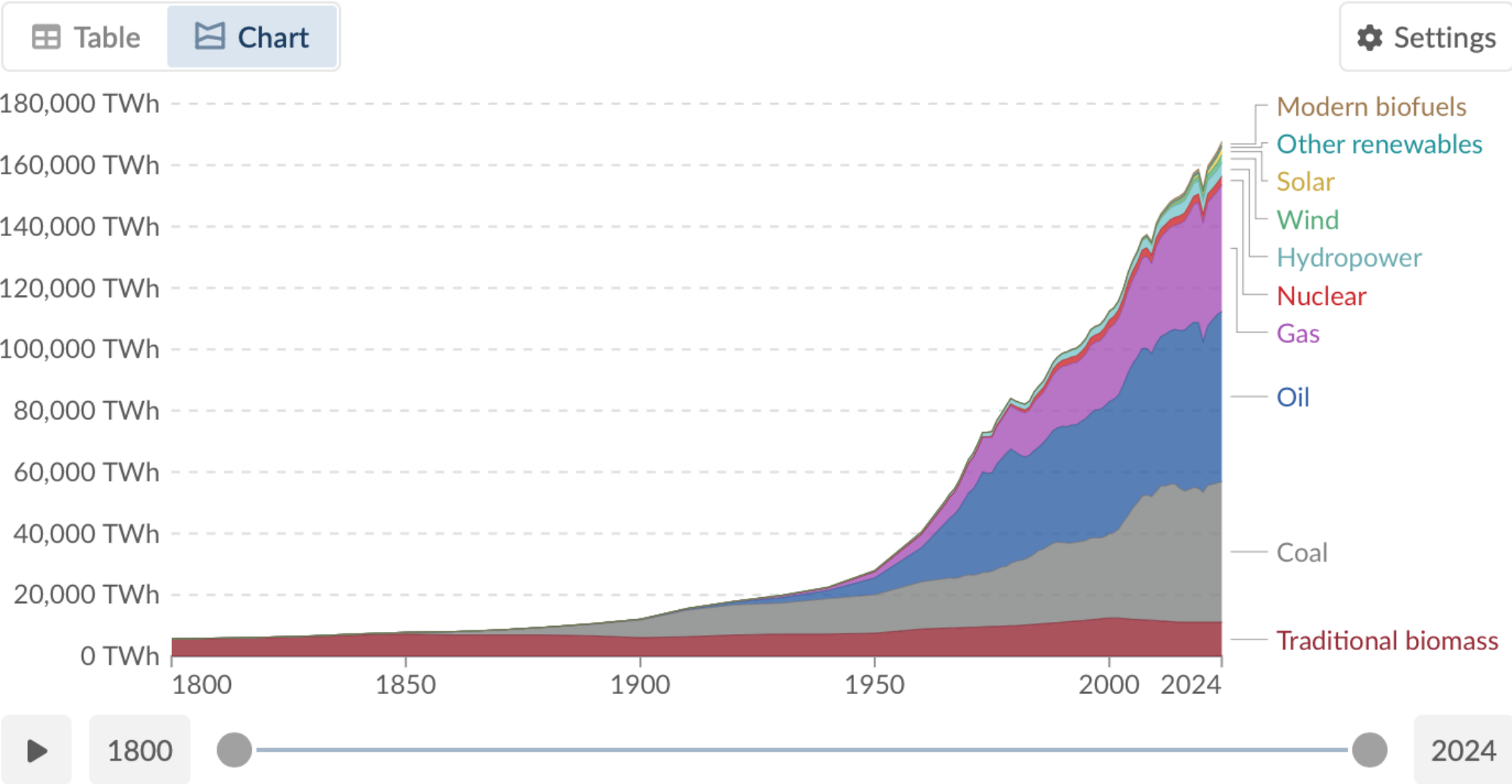


Source: United Nations World Population Prospects, Deutsche Stiftung Weltbevölkerung

For further information please visit: www.knowledge.allianz.com

Global direct primary energy consumption

Energy consumption is measured in terawatt-hours, in terms of direct primary energy. This means that fossil fuels include the energy lost due to inefficiencies in energy production.

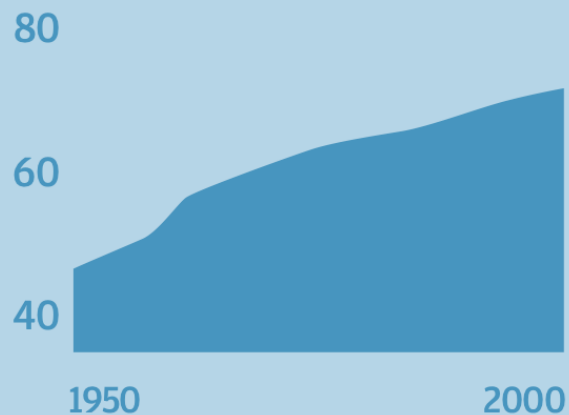


Data source: Energy Institute - Statistical Review of World Energy (2025); Smil (2017) – [Learn more about this data](#)

THE HUMAN POPULATION IS HEALTHIER THAN EVER BEFORE

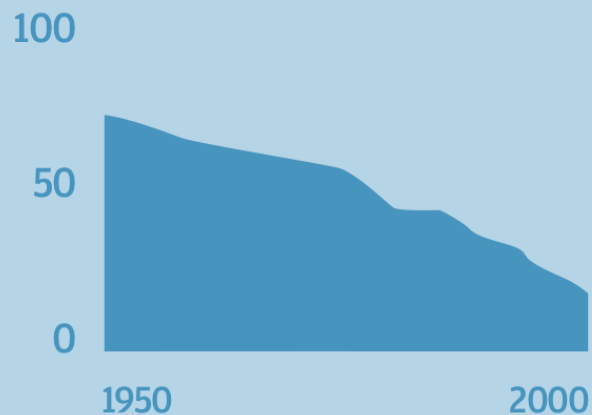
LIFE EXPECTANCY

Mean global life expectancy at birth (years)



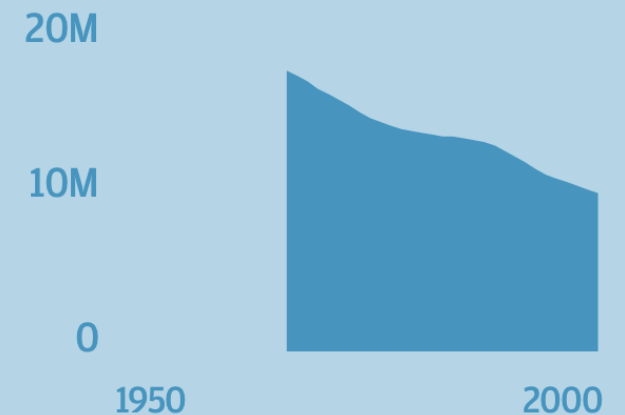
POVERTY

Population of world in poverty (%)



CHILD MORTALITY

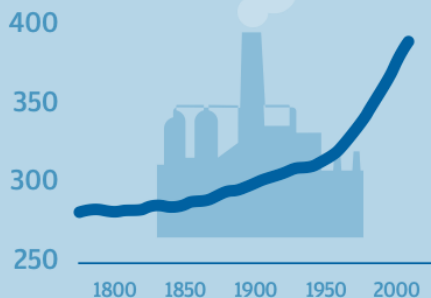
Recorded deaths of under-fives¹



BUT TO ACHIEVE THIS WE'VE EXPLOITED THE PLANET AT AN UNPRECEDENTED RATE

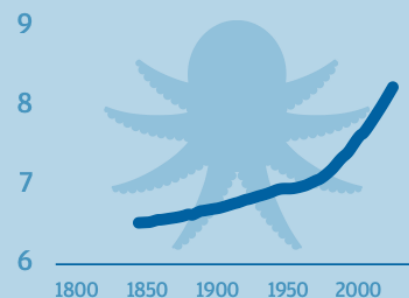
CARBON DIOXIDE EMISSIONS

Atmospheric concentration of CO₂ (ppm)



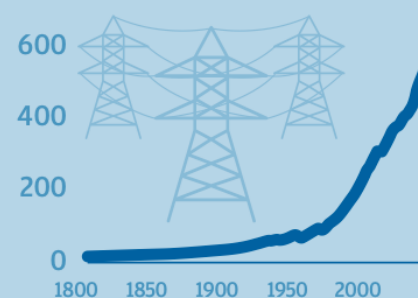
OCEAN ACIDIFICATION

Global ocean acidification (mean hydrogen ion concentration, nmol/kg)



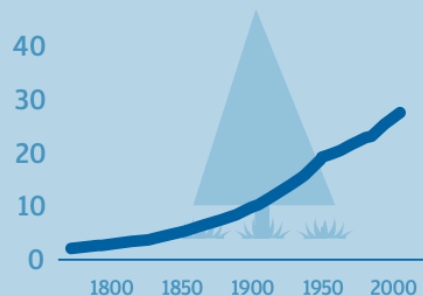
ENERGY USE

World primary energy use (EJ)



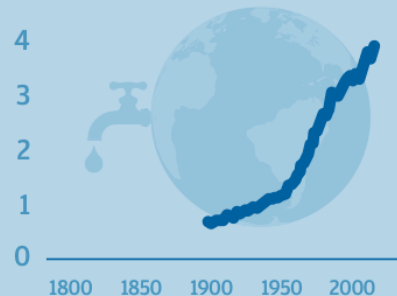
TROPICAL FOREST LOSS

Global tropical forest loss compared with 1700 baseline (%)



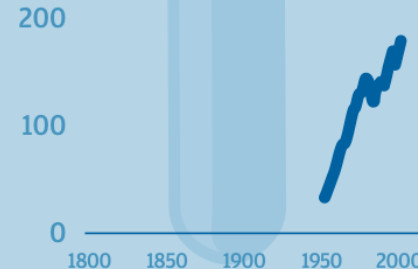
WATER USE

Water use (thousand km³)



FERTILISER USE

Global fertiliser use (nitrogen, phosphorus, and potassium; thousand tonnes)

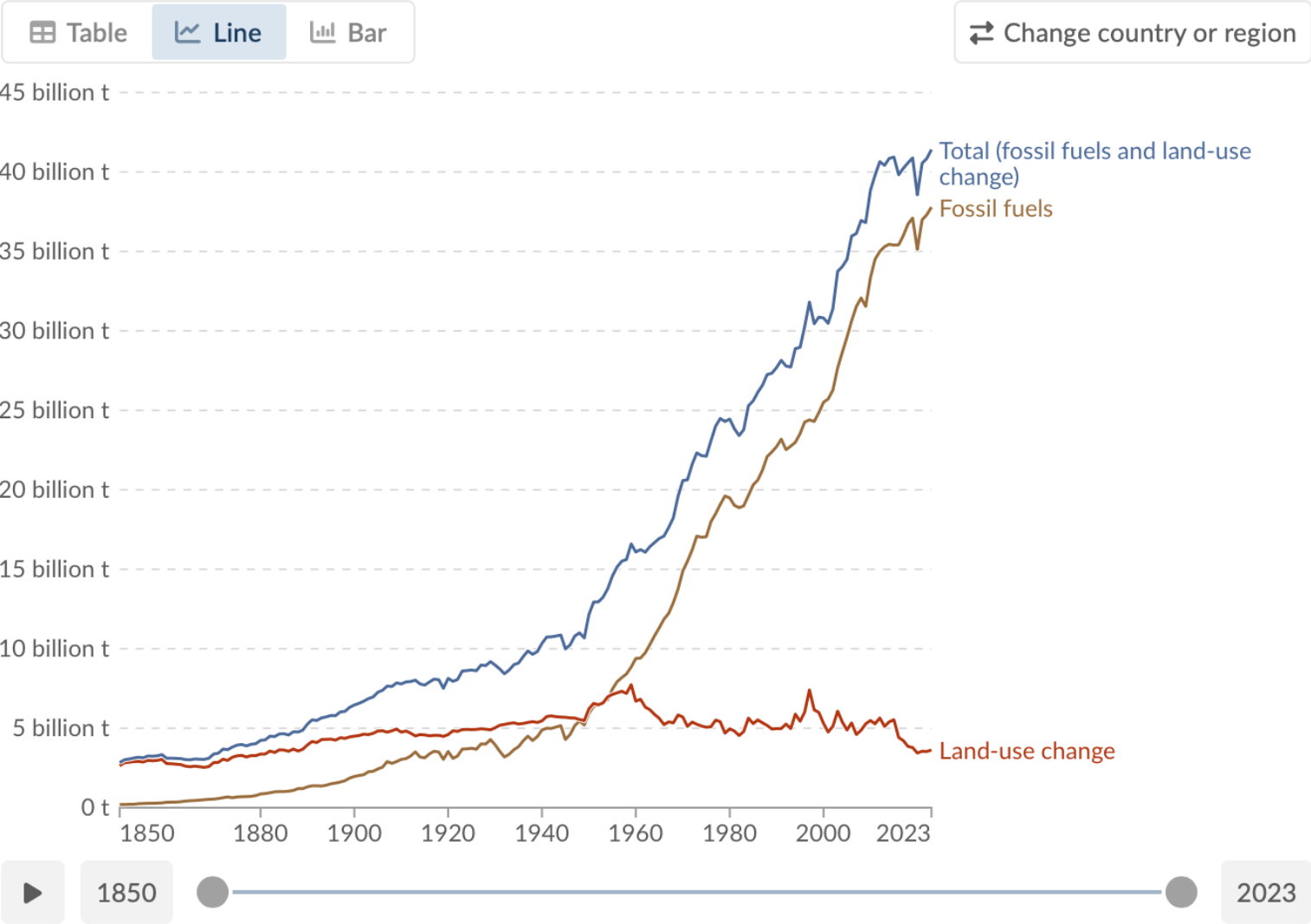


Over this recent period

- Global mass of plants halved
- Forest cover halved
- Humans plus the livestock we rear now constitute 96% of the mass of all mammals - everything else – from bilbies to elephants is the remaining 4%
- 70% of all birds alive are now poultry, mostly chickens
- The global mass of plastics is now double the mass of all land and sea animals (8Gt vs 4Gt)
- Atmospheric CO₂ increased from 280ppm to 430ppm

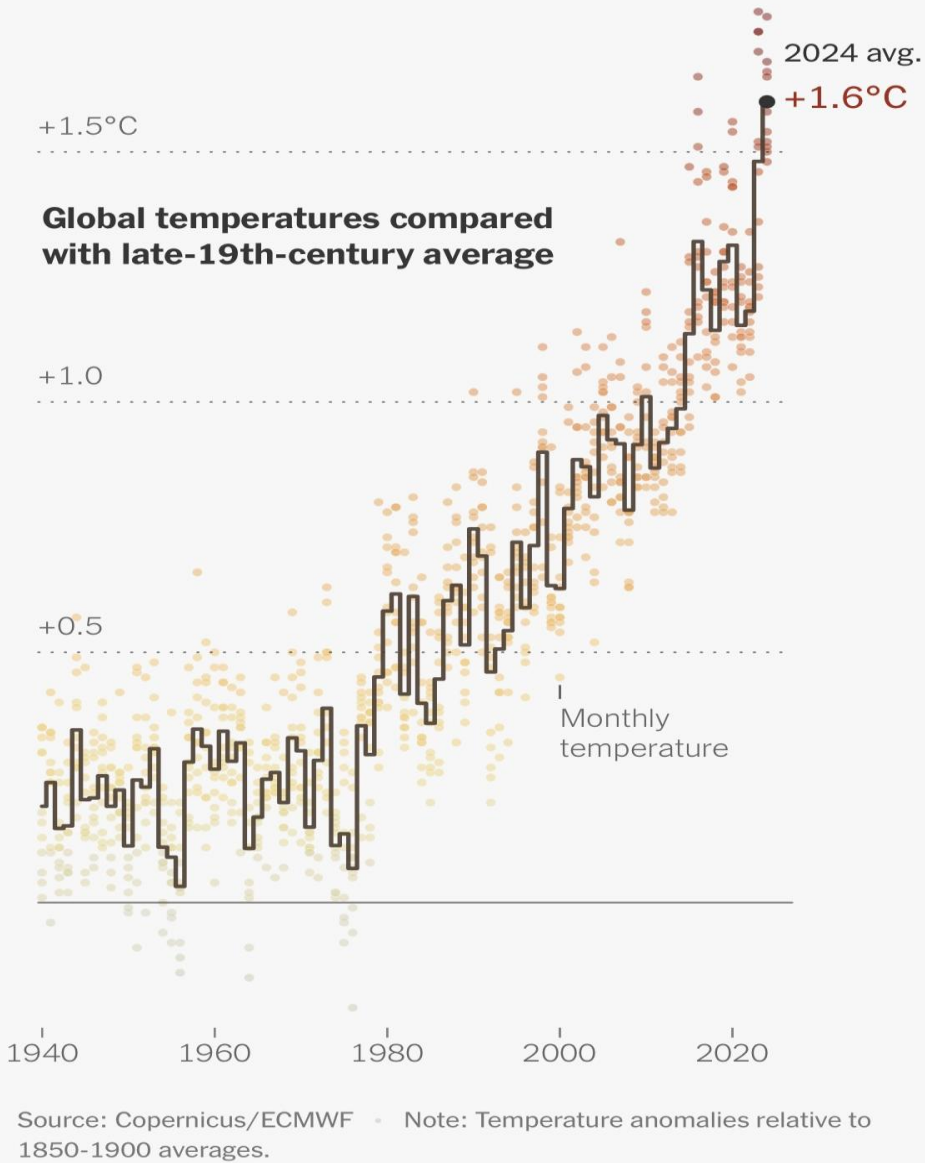
CO₂ emissions from fossil fuels and land-use change, World

Our World
in Data



Data source: Global Carbon Budget (2024) – [Learn more about this data](#)
OurWorldinData.org/co2-and-greenhouse-gas-emissions | CC BY

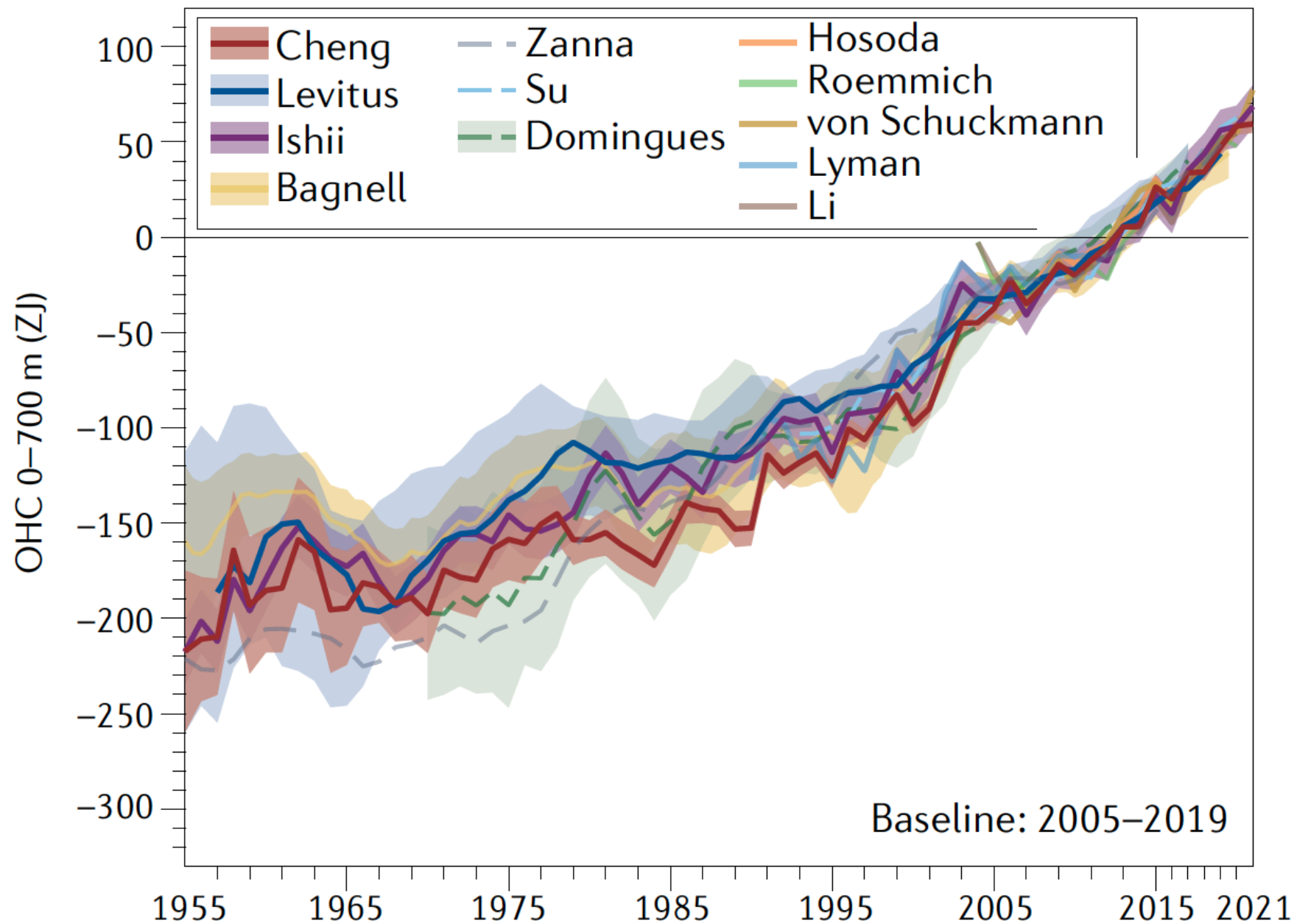
Global temperatures last year crept past a key goal, raising questions about how much nations can stop the planet from heating up further.



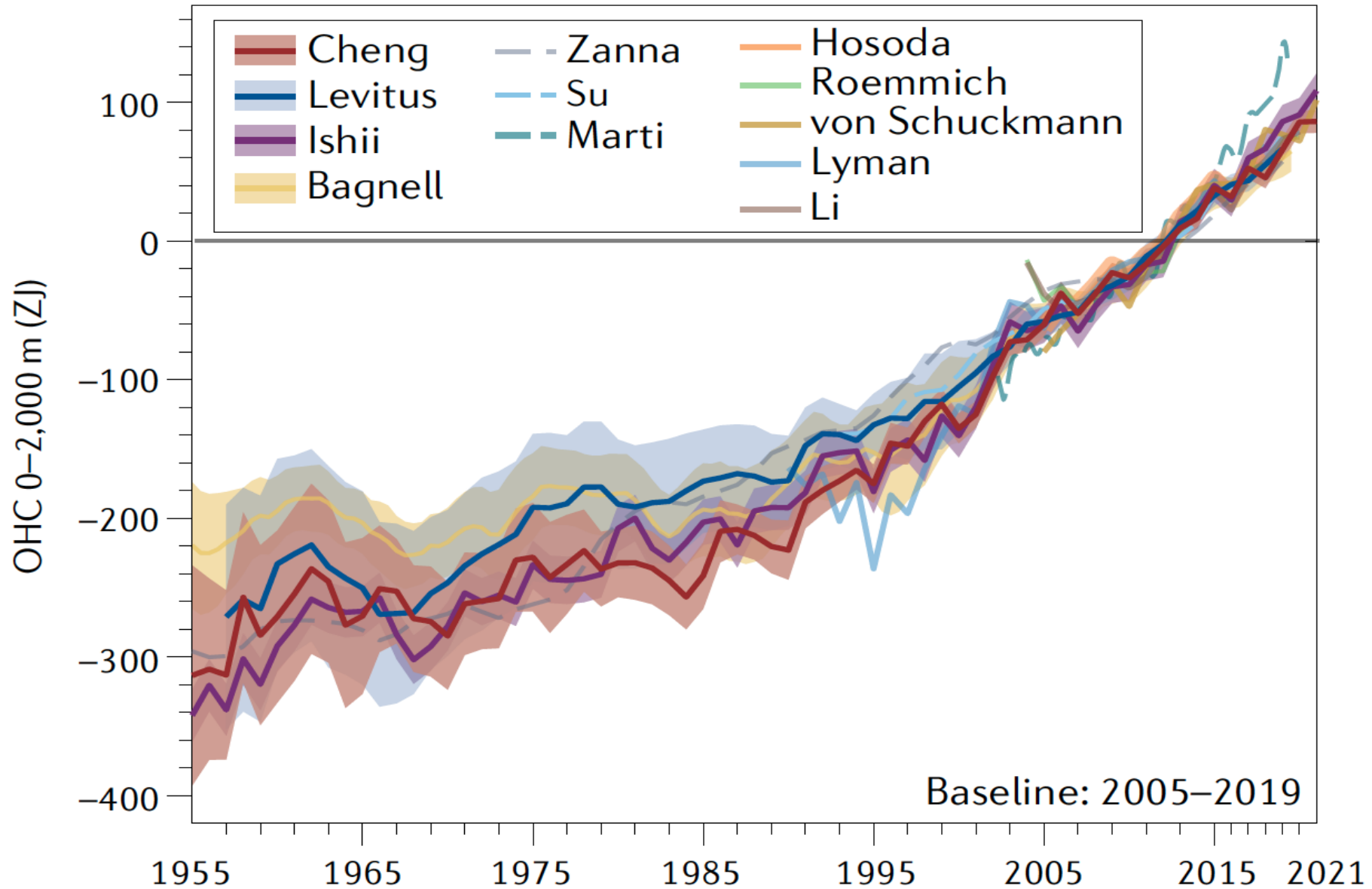
And in the ocean

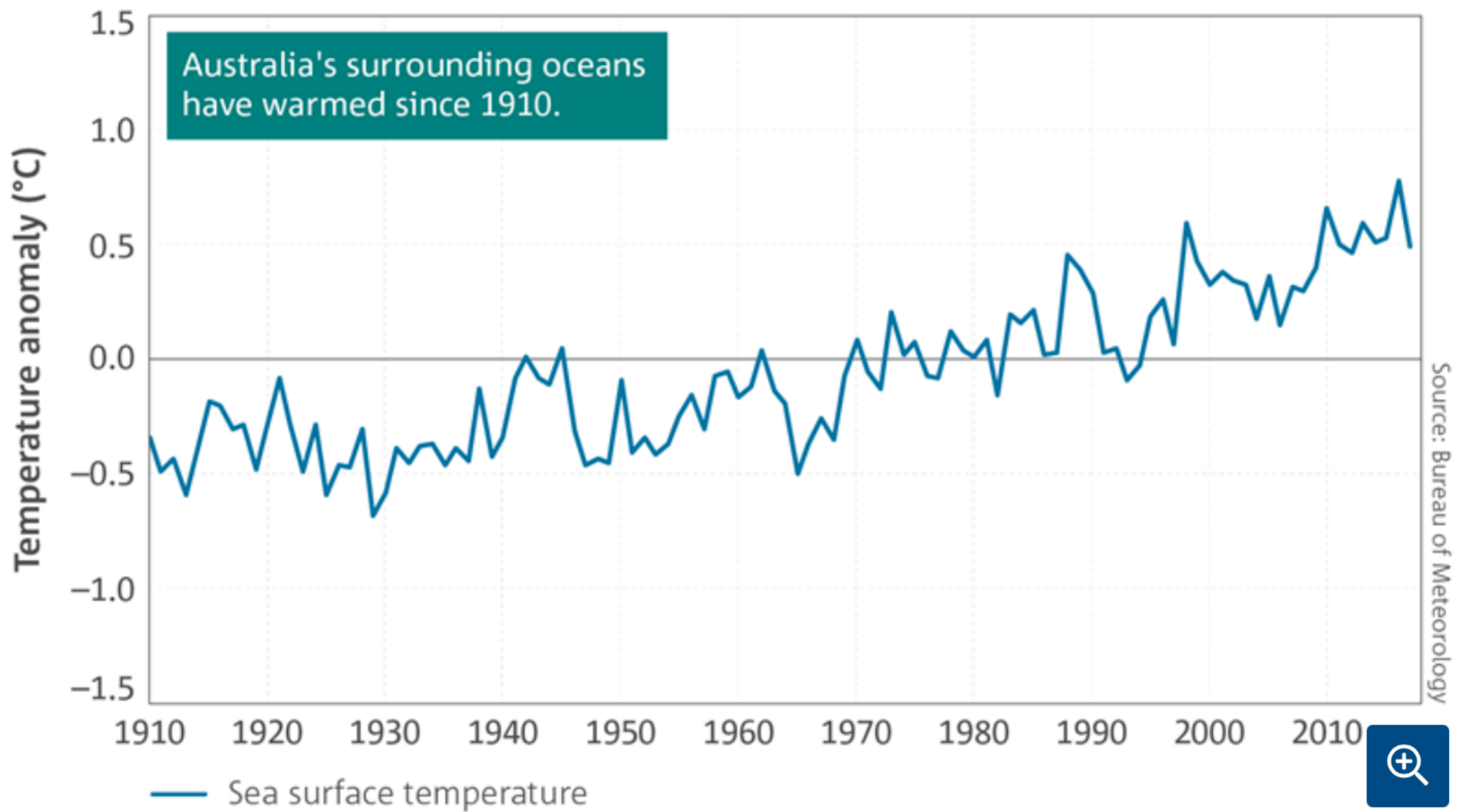
- Covers 70% of our planet's surface
- Holds 97% of the world's water
- absorbs over 90% of the Earth's energy imbalance
- produces half our oxygen and absorbs some 30% of atmospheric CO₂ increasing ocean acidity

a Estimated ocean warming (0–700 m)



c Estimated ocean warming (0–2,000 m)

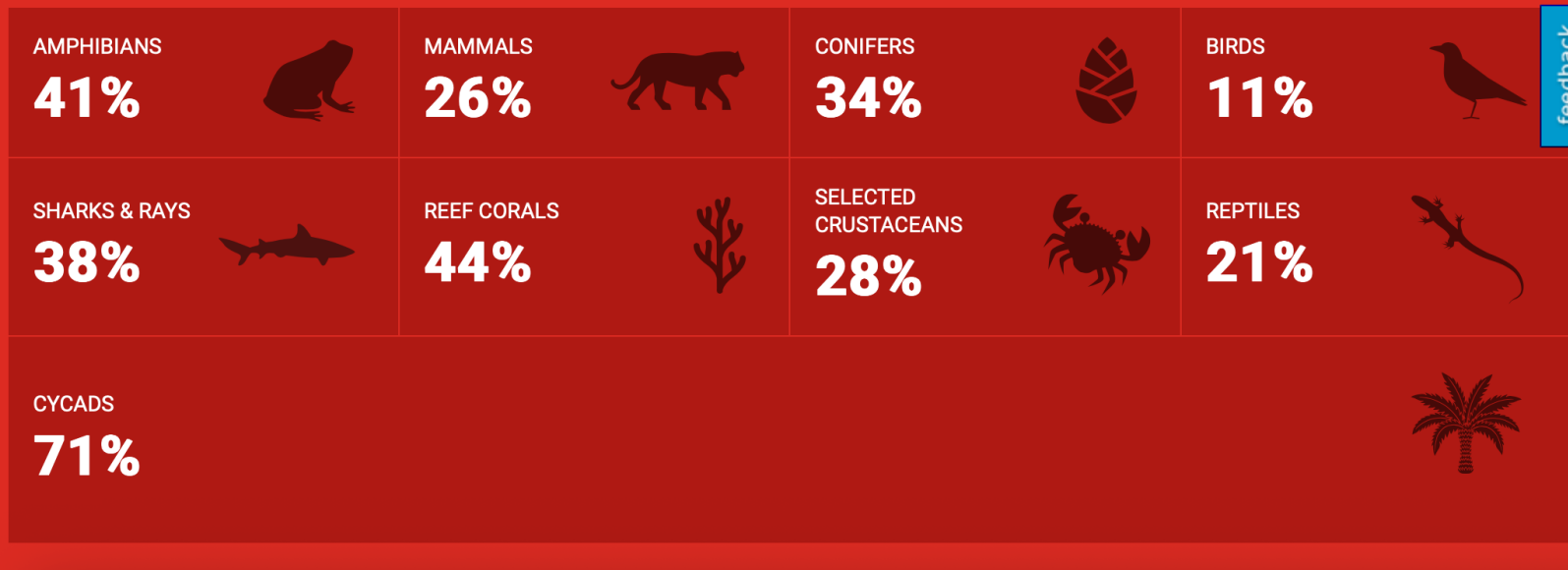




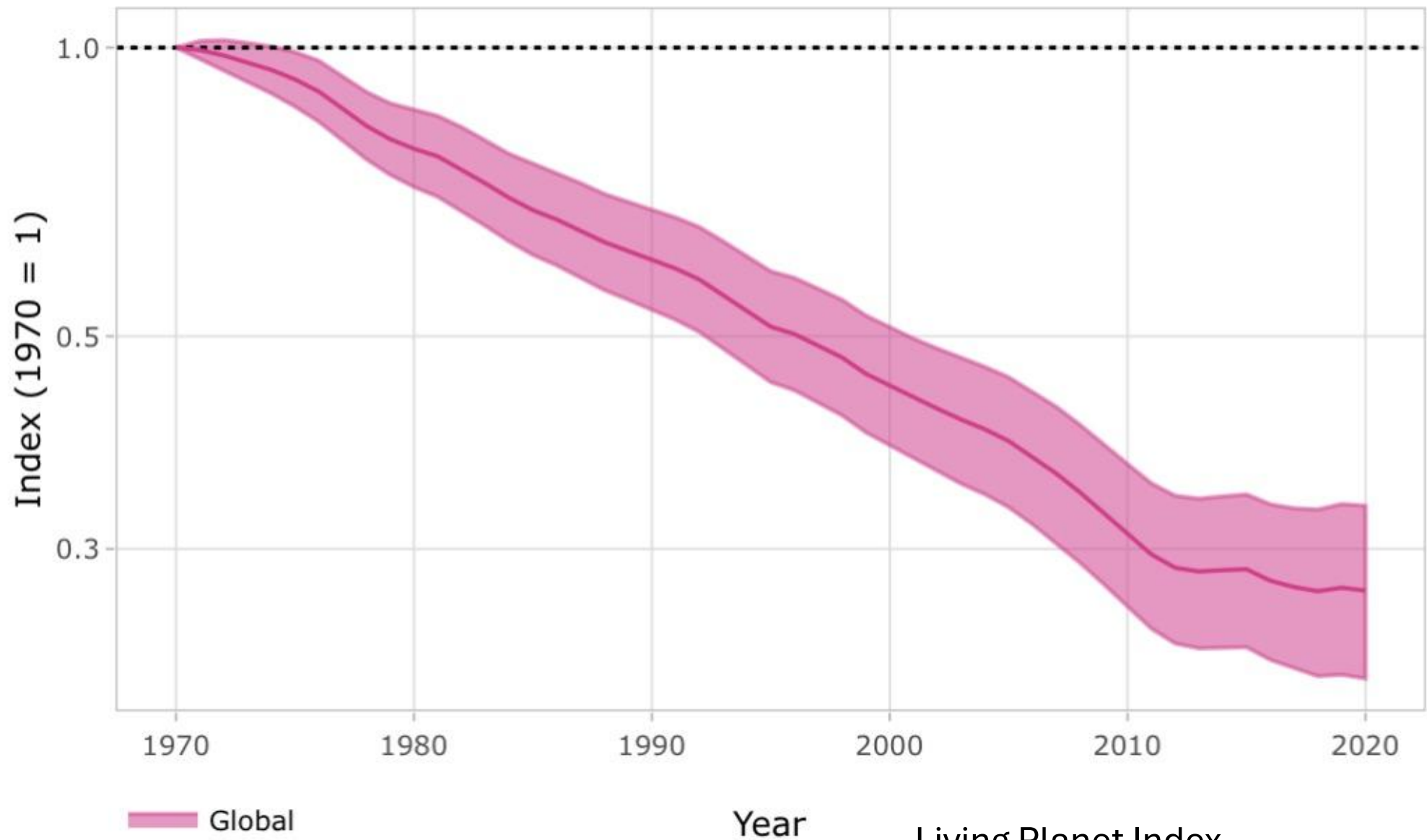
Anomalies in annual sea surface temperature in the Australian region. Anomalies are the departures from the 1961–1990 standard averaging period. Sea surface temperatures are for the Australian region (4–46° S and 94–174° E).

More than 48,600 species are threatened with extinction

That is 28% of all assessed species.

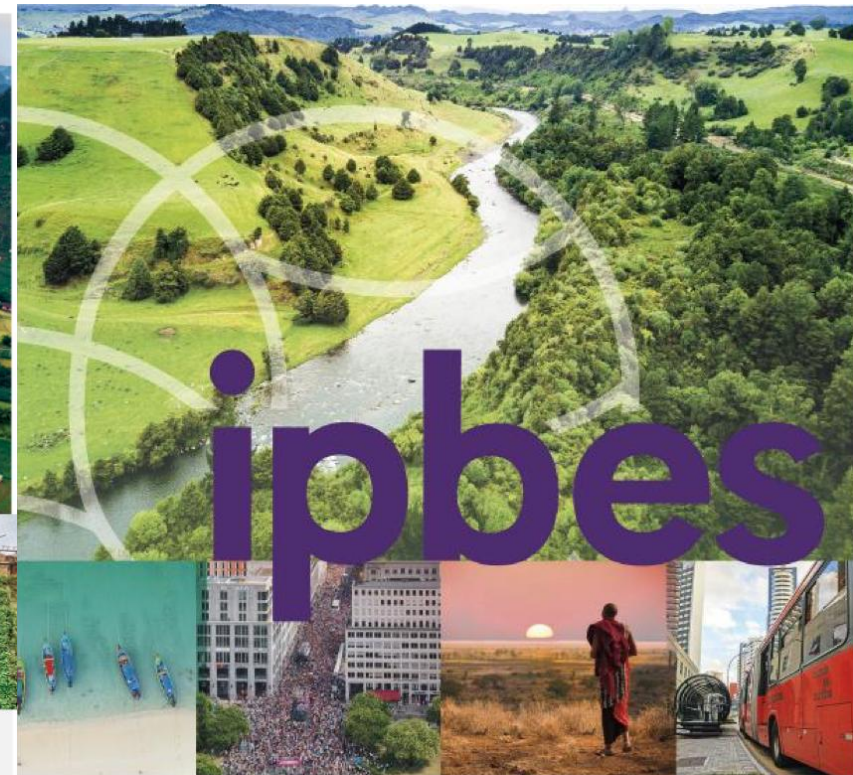
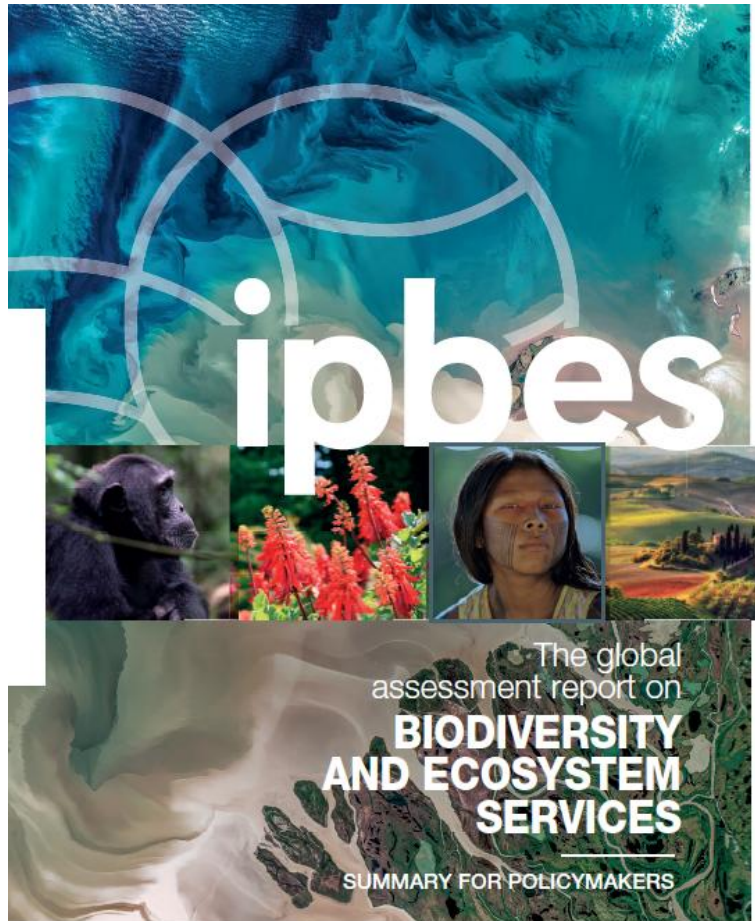


IUCN Red List



Living Planet Index
5495 species, 34836 populations

IPBES Global Assessment, Nexus, and Transformative Change Reports



Our planetary systems are being destabilised

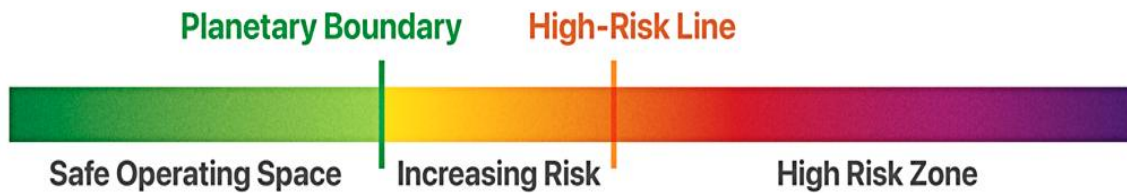
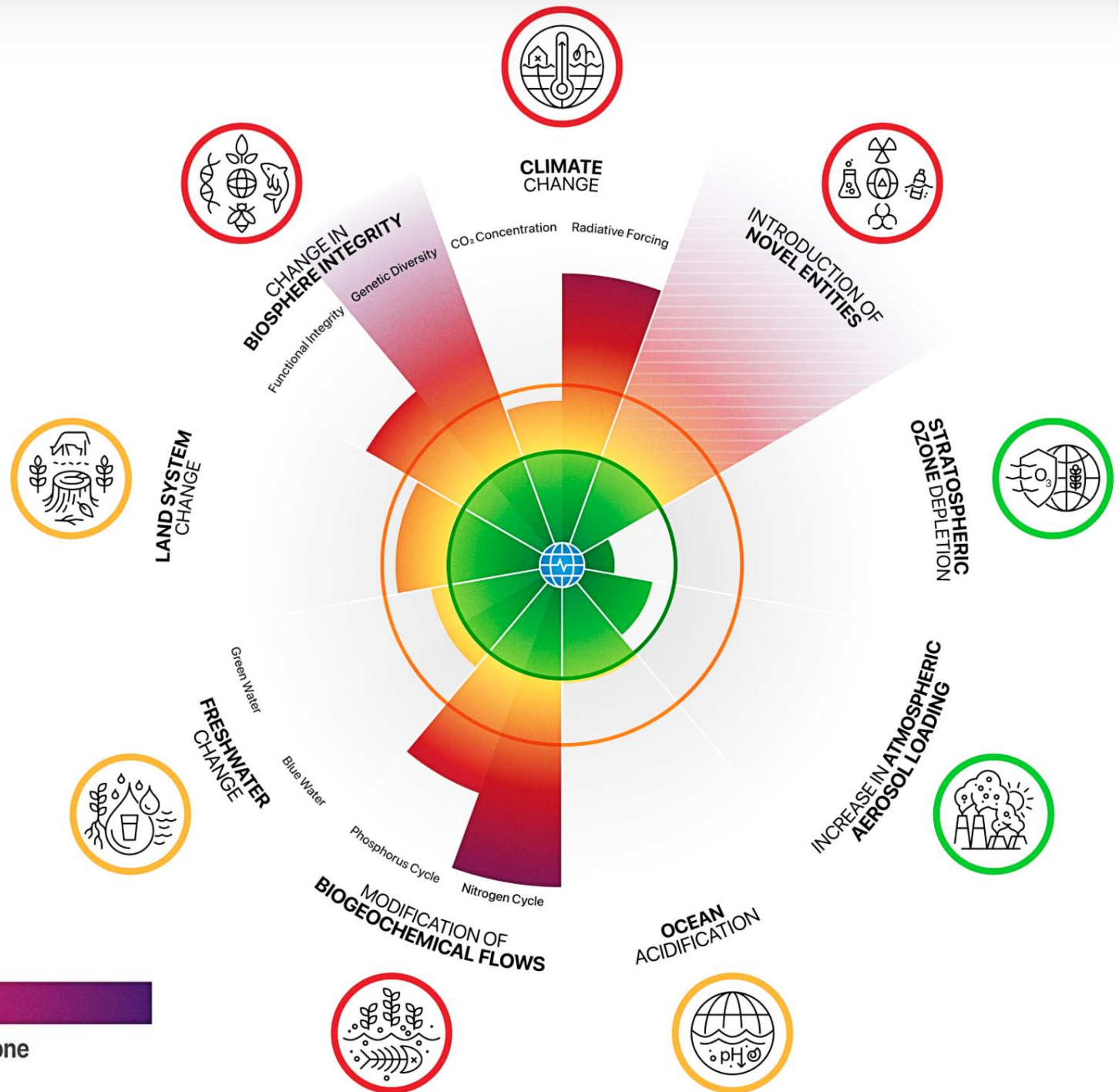
- We have compromised biosphere carbon sequestration - by the scale of habitat removal, conversion, and degradation
- Ocean heat increase, sea level rise, acidification and deoxygenation are on a trajectory that will take centuries to reverse
- Some of the destabilisers may be triggering knock-on effects, amplifying their impacts
- We can't ignore the interconnectedness of these issues
- The risks are deep, pervasive and permeate our social, economic and political structures and thinking

Entering a period of consequences

Owing to past neglect, in the face of the plainest warnings, we have entered upon a period of danger. The era of procrastination, of half measures, of soothing and baffling expedients of delays is coming to a close. In its place we are entering a period of consequences.

Winston Churchill 1936

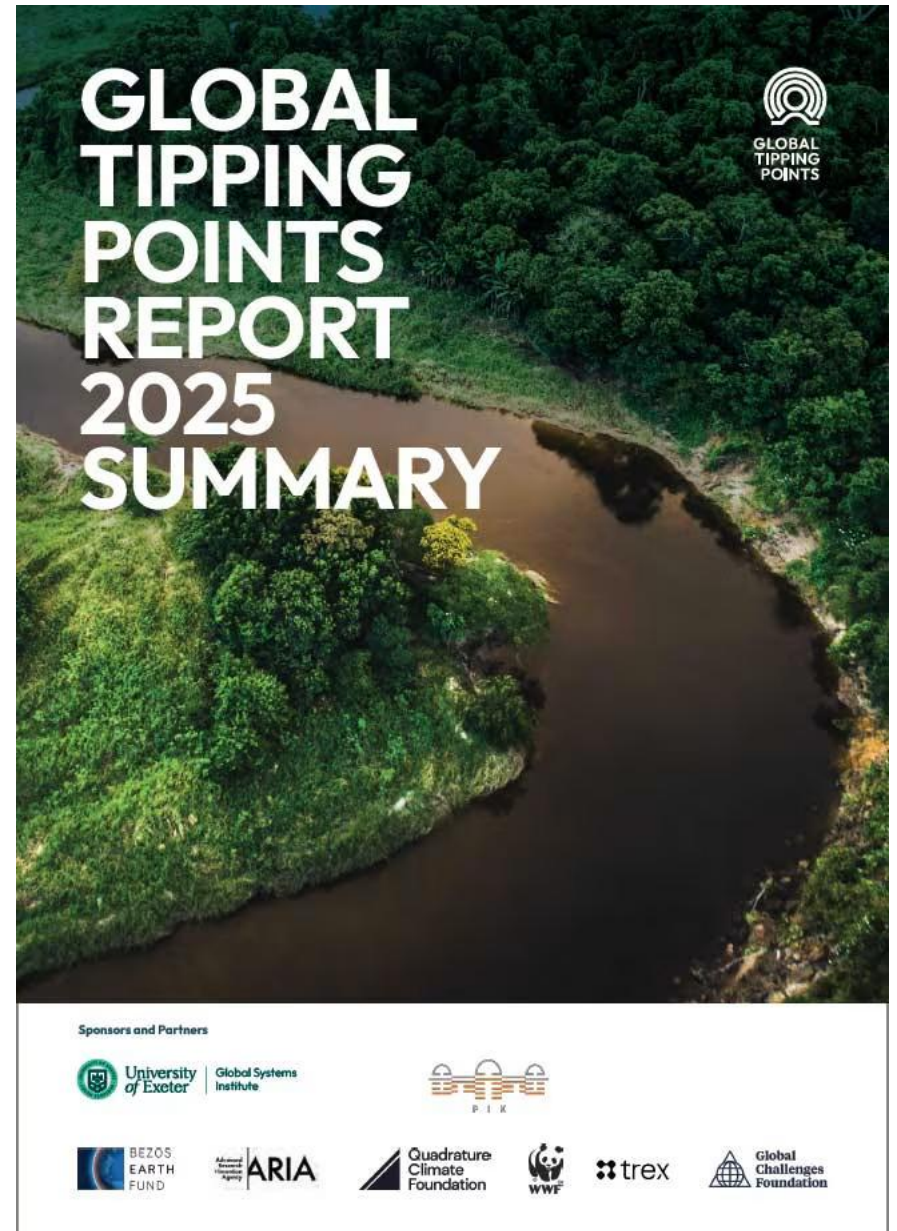
Planetary boundaries



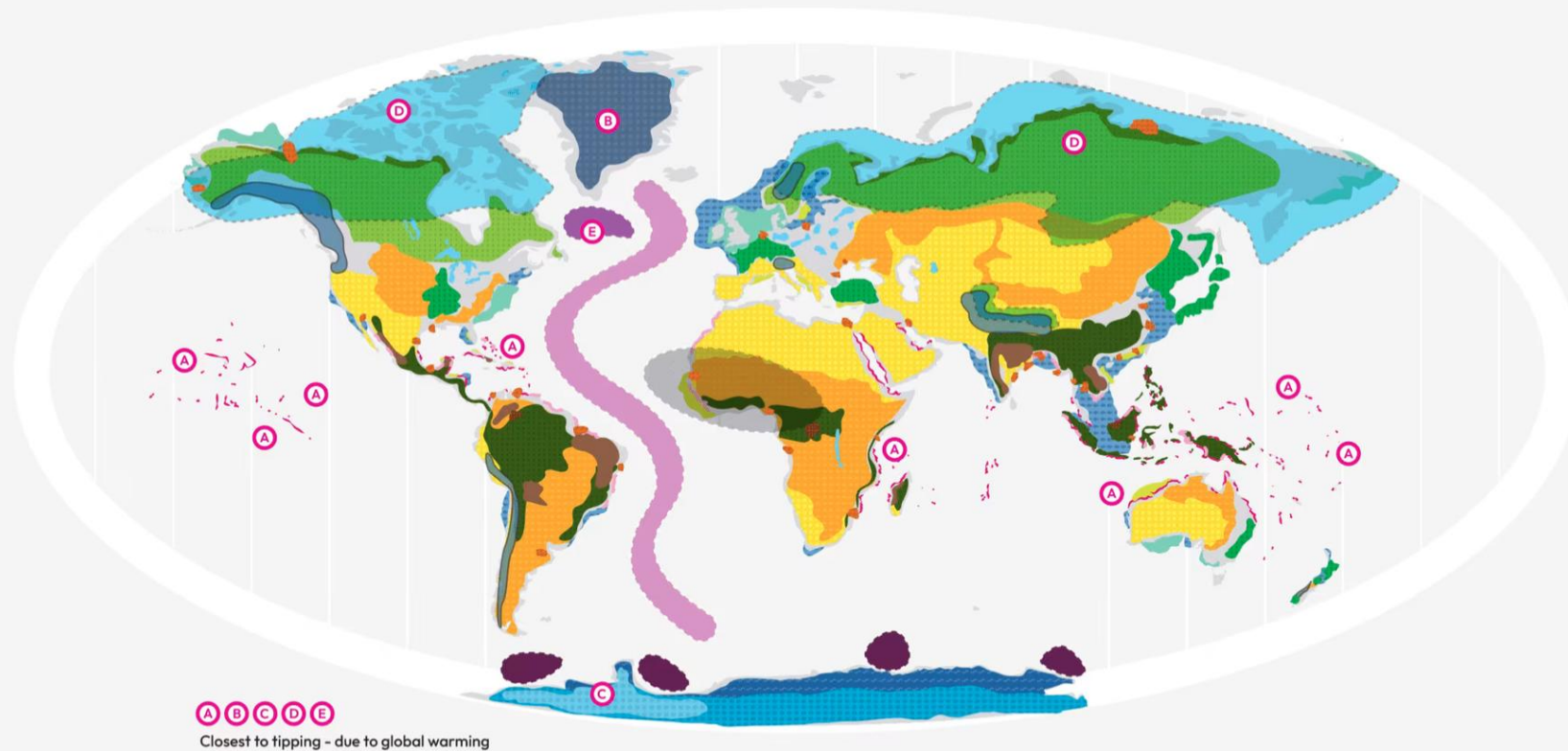
Tipping points

A negative tipping point is a critical threshold that, when crossed, leads to large, accelerating and often irreversible changes

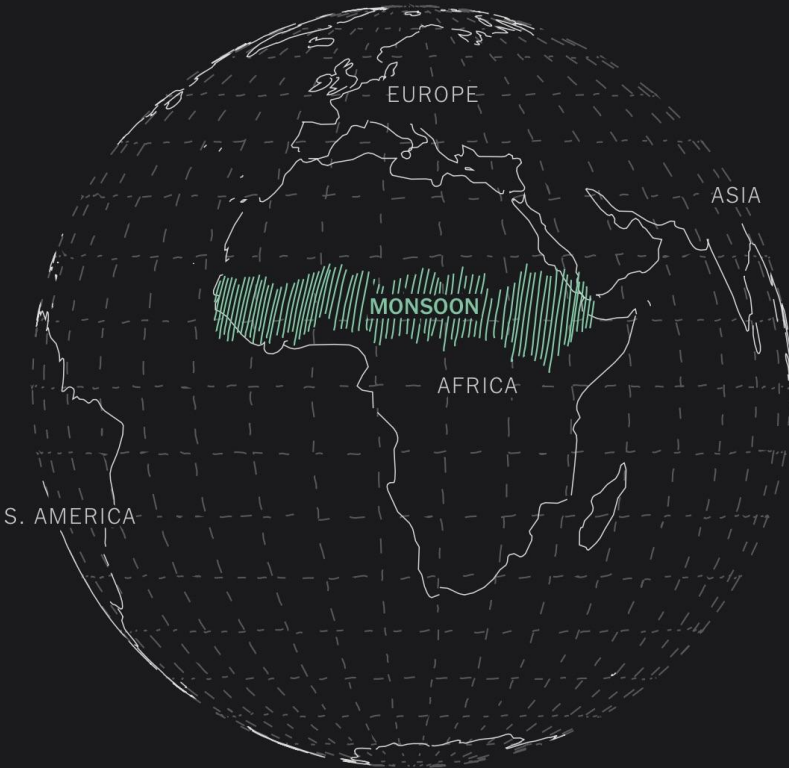
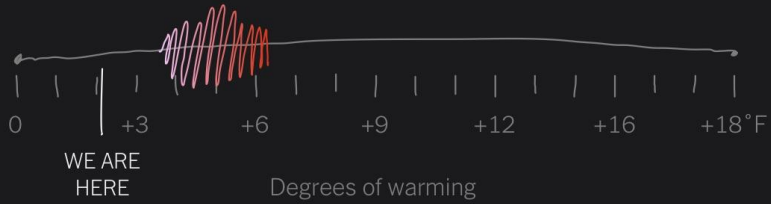
A positive tipping point is a critical threshold that once crossed becomes self-amplifying and self-sustaining



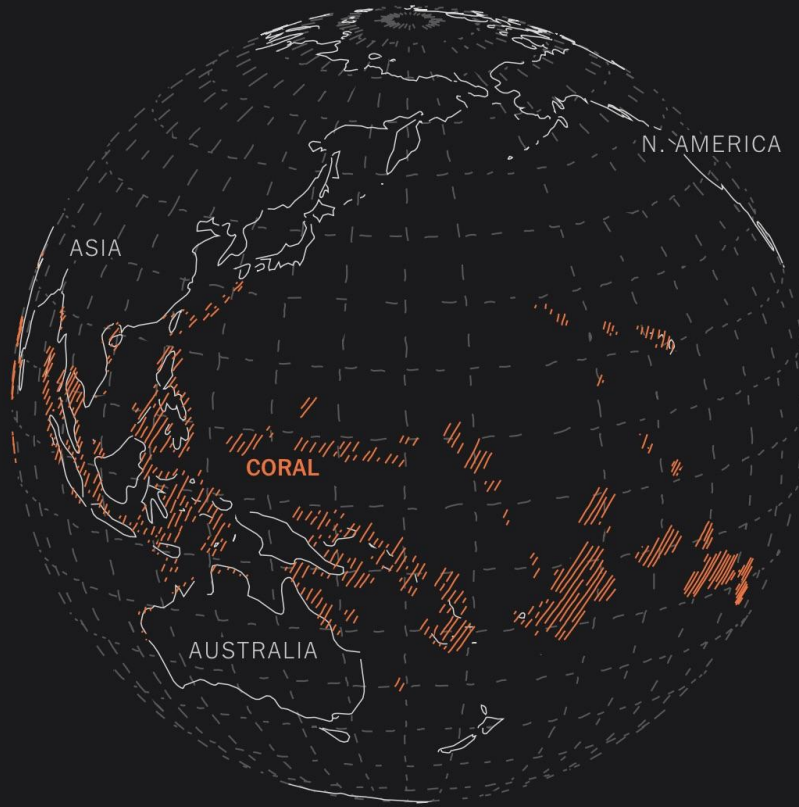
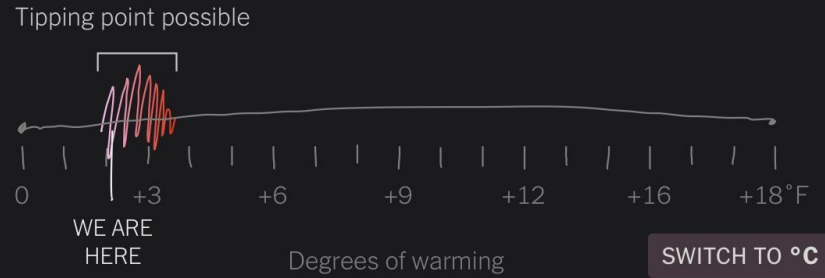
PARTS OF THE EARTH SYSTEM IDENTIFIED AS FEATURING TIPPING POINTS



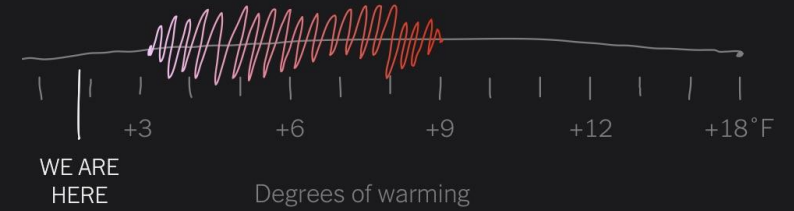
Sudden Shift in the West African Monsoon



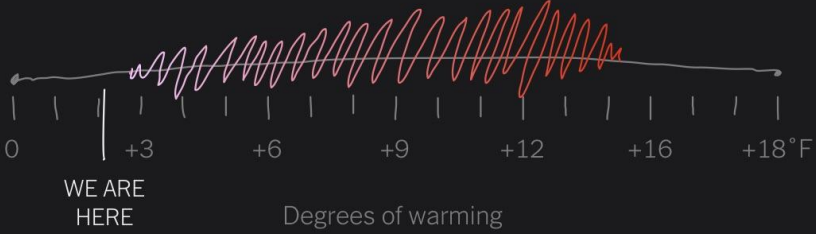
Mass Death of Coral Reefs



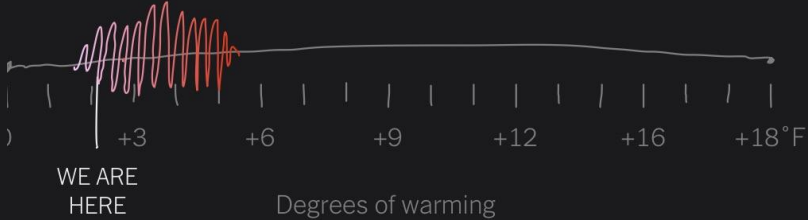
Loss of Amazon Rainforest



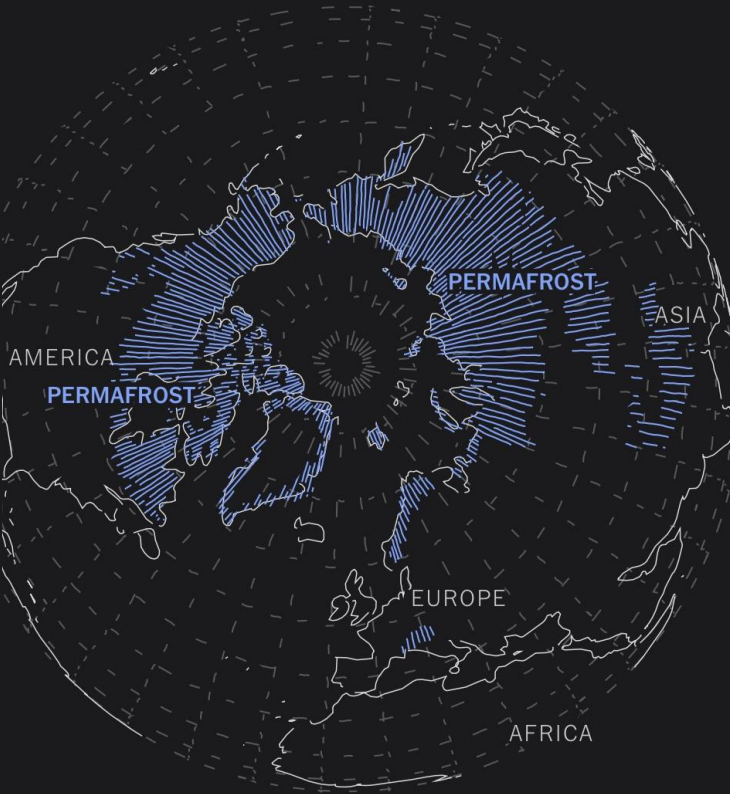
Shutdown of Atlantic Currents



Collapse of Greenland Ice



Abrupt Thawing of Permafrost



Who is paying attention?

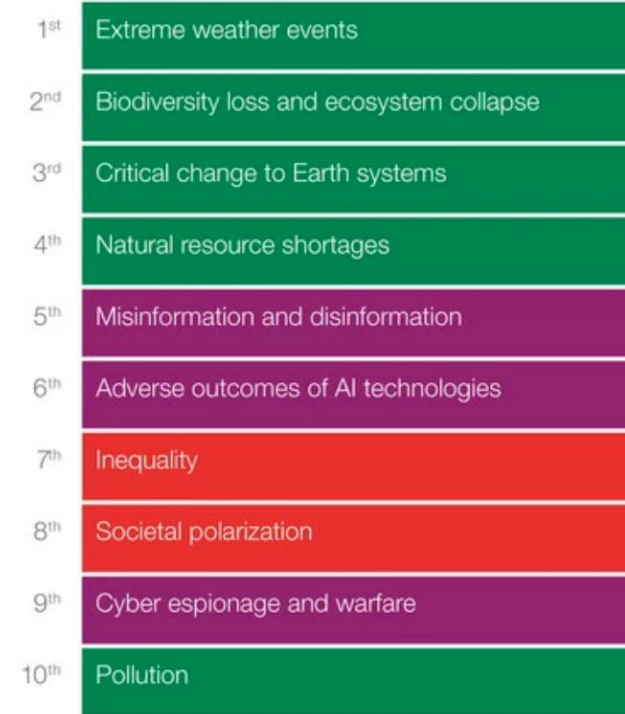
Global risks ranked by severity

Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period.

Short term (2 years)

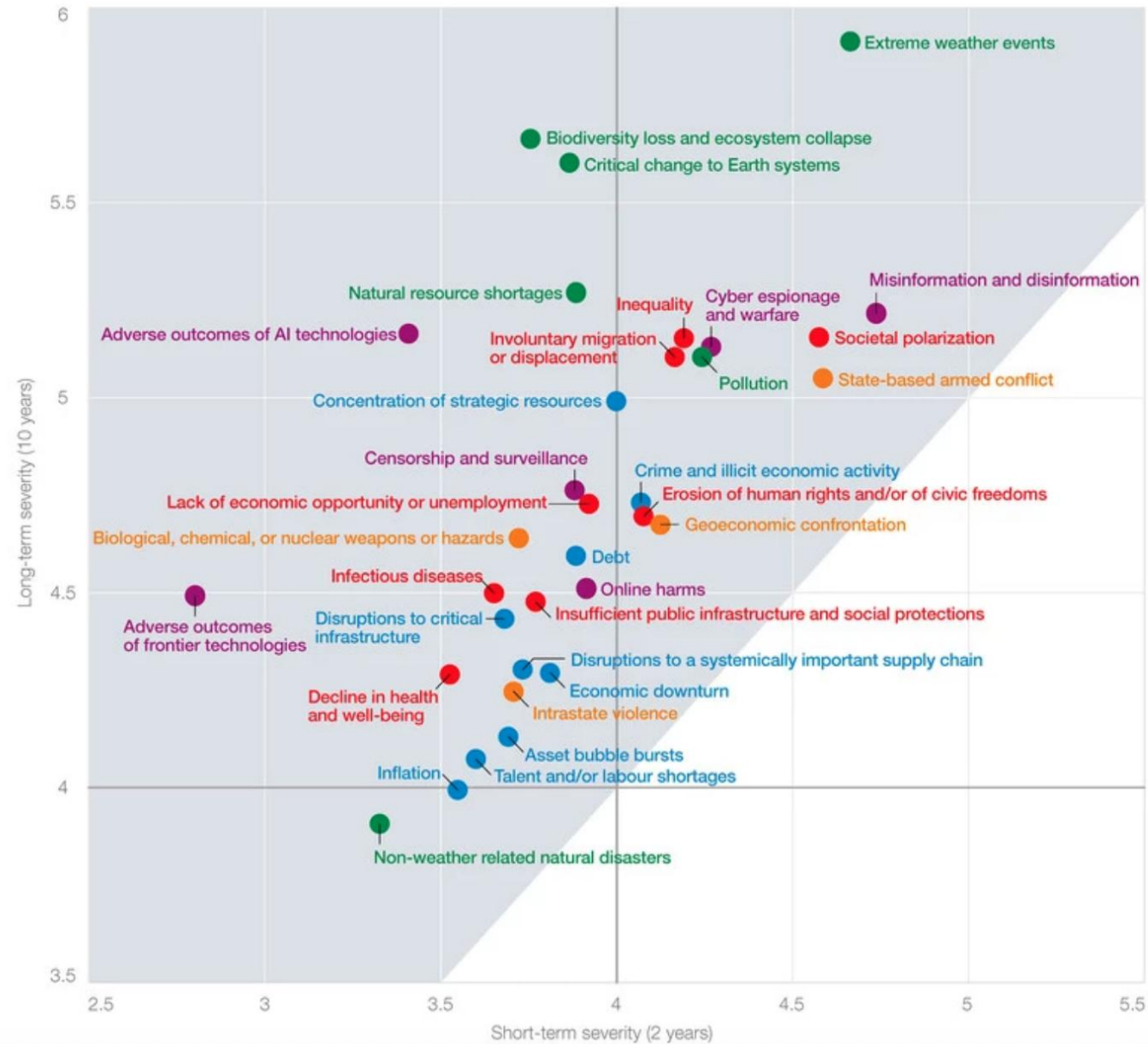


Long term (10 years)



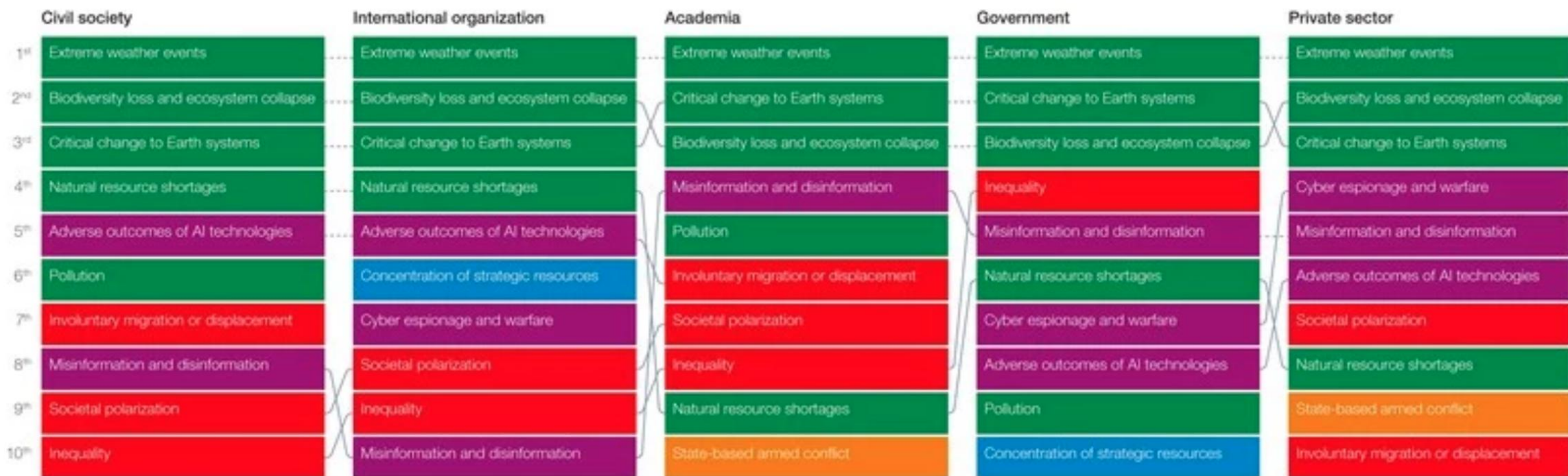
Risk categories ● Economic ● Environmental ● Geopolitical ● Societal ● Technological

Source: World Economic Forum, Global Risks Perception Survey 2024-2025



Global risks ranked by severity

Severity ranking by stakeholder over the long term (10 years)



Risk categories ● Economic ● Environmental ● Geopolitical ● Societal ● Technological

Source: World Economic Forum, Global Risks Perception Survey 2024-2025

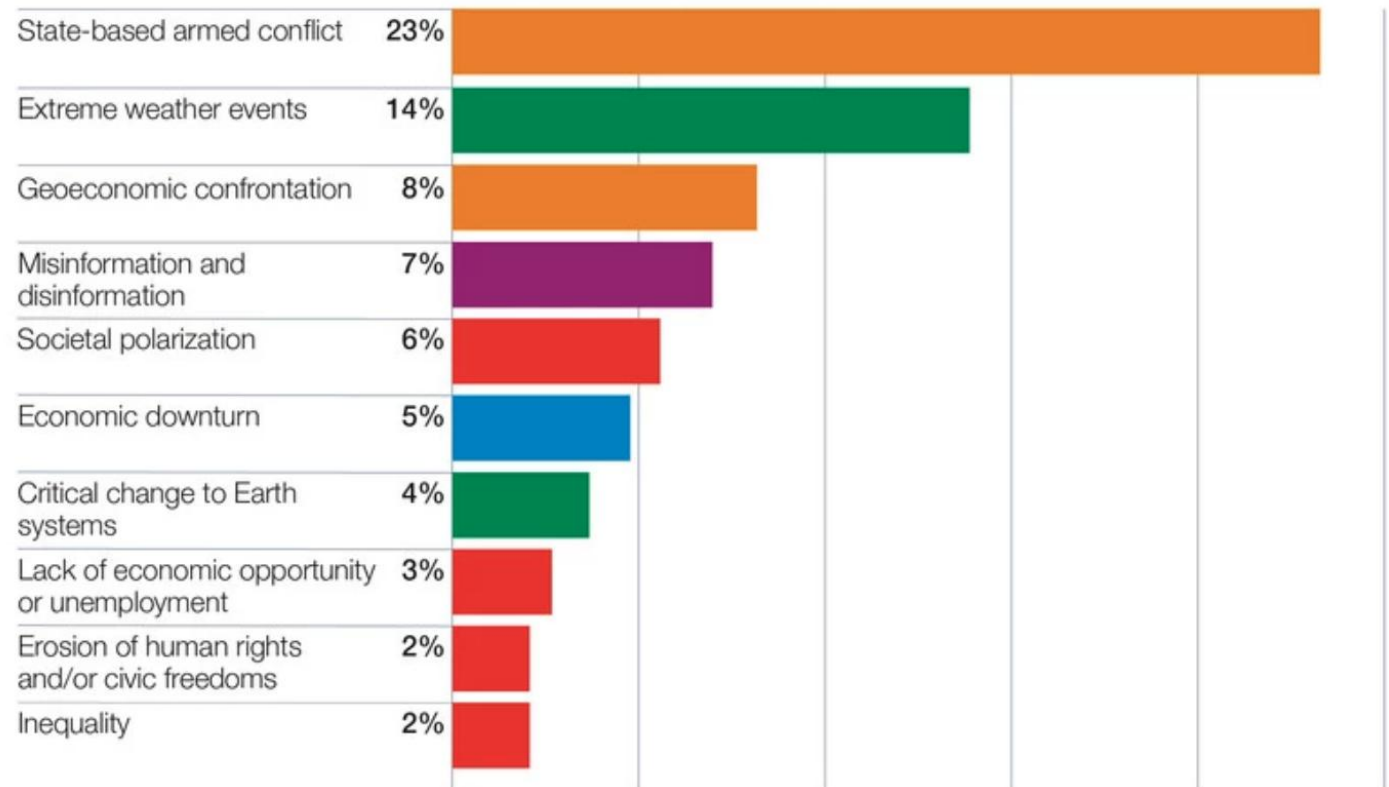
But...

What's
currently
focusing
minds?

Current Risk Landscape

Please select one risk that you believe is most likely to present a material crisis on a global scale in 2025.

Top 10 risks selected by respondents (Share of respondents %)



Risk categories: Economic (Blue), Environmental (Green), Geopolitical (Orange), Societal (Red), Technological (Purple)

Source: World Economic Forum, Global Risks Perception Survey 2024-2025

And if

Our economic and financial systems continue with linear thinking (extract-convert-sell-use-dispose; or an input and an output) and on the assumption of future growth

Success is measured by return on investment (itself predicated on growth)

Our primary concern is ourselves (our living standards, illness, longevity, wealth) (nb 80% of philanthropy is invested in medicine and the arts)

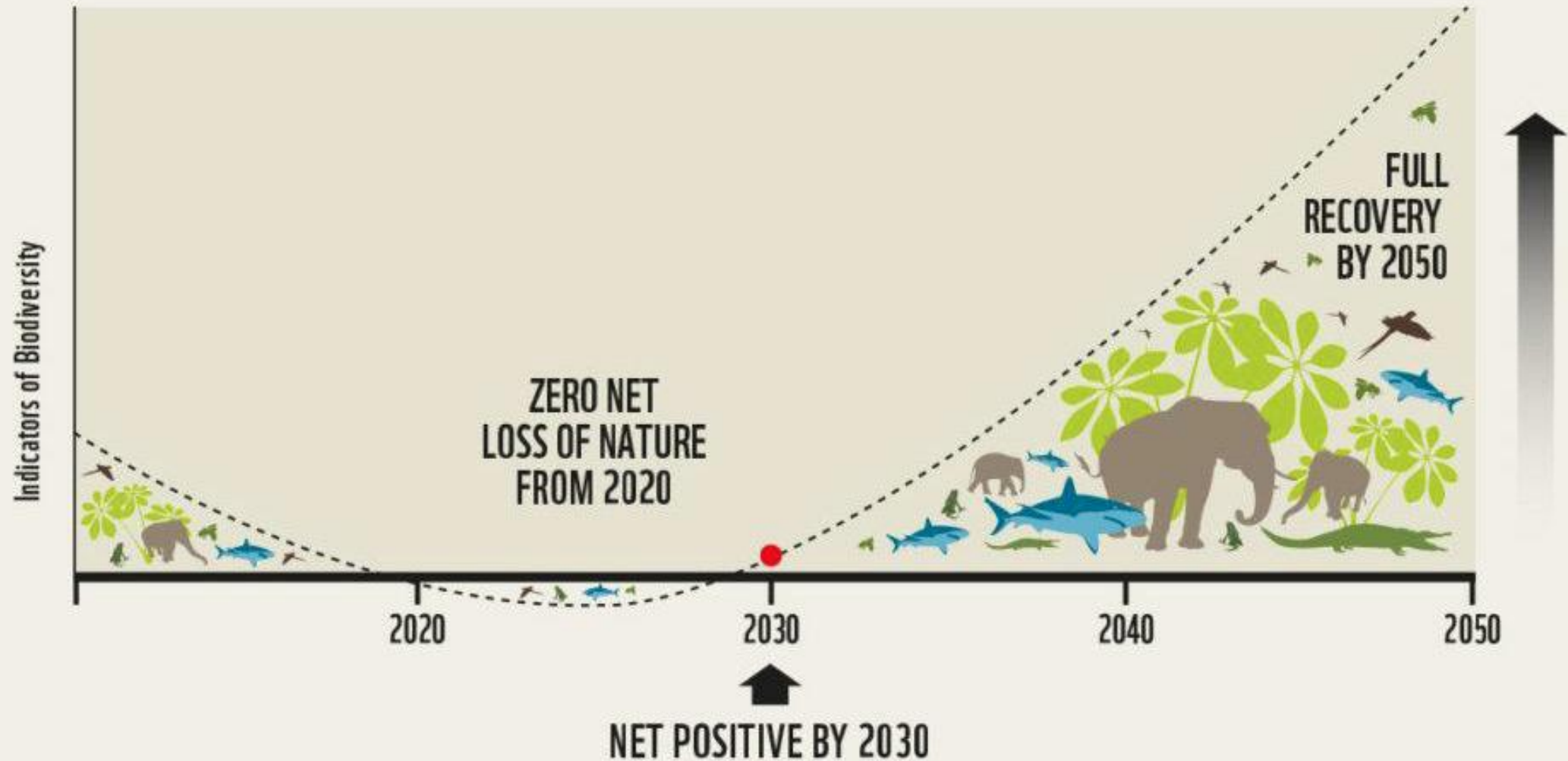
The vast majority of govt and private spend continues on us (environment 1-2% of budgets and is seen as a cost rather than an investment)

We continue to focus our technological prowess and ingenuity on ourselves and not the world we live— we remain outside the self-regulating feedback loops that in nature control population numbers

Then the future is not bright for us or any other species

Nonetheless, there is change

Global Goal for Nature: Nature Positive by 2030





Taskforce on Nature-related
Financial Disclosures

Welcome to the Taskforce on Nature-related Financial Disclosures

**Developing and delivering a risk
management and disclosure
framework for organisations to
report and act on evolving
nature-related risks**

TNFD

- Commenced in July 2020
- Launched in June 2021, the TNFD received widespread support from financial institutions, corporates, governments and civil society.
- G7 Finance Ministers and the G20 Sustainable Finance Roadmap have endorsed the TNFD. The G20 and G7 Environment and Climate Ministers have also recognised the establishment of the TNFD.
- Funding for the TNFD is provided by governments, the UN, and philanthropic foundations, including the Australian, Netherlands, Swiss and UK governments; the Global Environment Facility (GEF), and the United Nations Development Programme (UNDP)

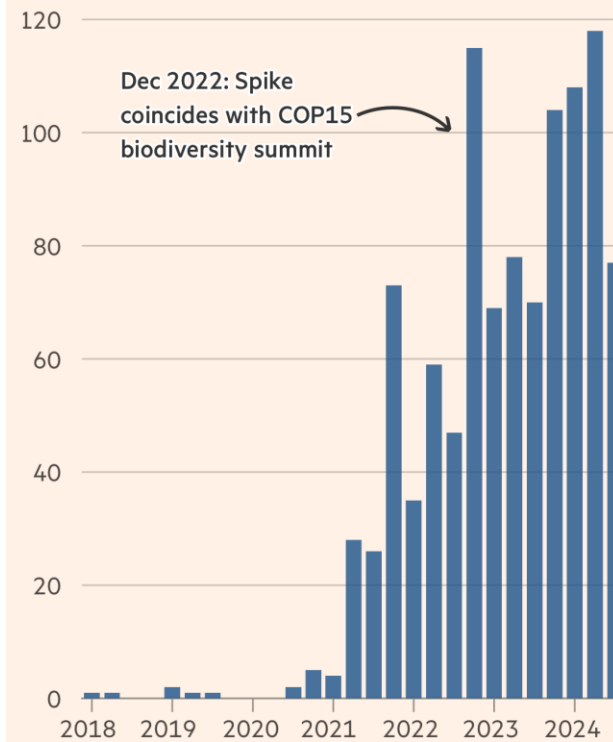
TNFD Knowledge partners

- Agence Française de Développement (AFD)
- CDP
- Cambridge Institute for Sustainability Leadership (CISL)
- Centre for Nature-based Climate Solutions (CNCS) at National University of Singapore
- Global Reporting Initiative (GRI)
- International Union for Conservation of Nature (IUCN)
- Network for Greening the Financial System (NGFS)
- The Organisation for Economic Co-operation and Development (OECD)
- International Sustainability Standards Board (ISSB)
- Science Based Targets Network (SBTN)
- Stockholm Resilience Centre at Stockholm University, with partners Beijer Institute and Global Economic Dynamics and the Biosphere (GEDB) Academy Program of the Royal Swedish Academy of Sciences
- The Capitals Coalition
- UNEP World Conservation Monitoring Centre (UNEP-WCMC)
- UN Statistics Division (UNSD)
- The World Business Council for Sustainable Development (WBCSD)
- WWF
- IPBES



'Nature positive' becomes a corporate buzzword

Mentions of the phrase in company press releases, since its first use



Nature becoming mainstream where it matters



NGFS Occasional Paper

Central banking and supervision in the biosphere:

**An agenda for action on biodiversity
loss, financial risk and system stability**

**Final Report of the NGFS-INSPIRE Study Group on
Biodiversity and Financial Stability**

An Overview of Nature-Related Risks and Potential Policy Actions for Ministries of Finance:

Bending The Curve of Nature Loss

Authors:

Samantha Power, Nepomuk Dunz,
and Olga Gavryliuk (World Bank)

A product of the Helsinki Principle 5 Workstream

June 2022

Biodiversity Risk:
Legal Implications for Companies and their Directors

Commonwealth Climate and Law Initiative
Jennifer Ramos and Zaneta Sedilekova
13 December 2022



The Economics of Biodiversity: The Dasgupta Review



**NATURE
POSITIVE
INITIATIVE**

MENU 



A GLOBAL GOAL FOR NATURE

Nature Positive by 2030



KEY DOCUMENT S



Measuring what matters: building the metrics for a nature positive world

Published 13 August

A look back and ahead on the project to align global metrics to measure the state of nature and deliver a nature-positive world.



Towards shared ocean metrics: measuring nature-positive outcomes for the ocean

Published 6 August 2025

Over the next year, the partnership between the Nature Positive Initiative, the Ocean Risk and Resilience Action Alliance (ORRAA) and the World Economic Forum will work towards a collaborative roadmap in building consensus on marine state of nature metrics.

Climate Impact Research





International Union for Conservation of Nature

- Produces knowledge products (eg Red Lists of Species Ecosystems), best practice guidance for conservation planning, management, monitoring etc)
- Provides data, analysis, assessments, and policy, scientific, technical and legal advice
- Delivers conservation programs and projects
- Develops tools and global standards (eg Nature-based Solutions; Protected Area categories, Green list of Protected Areas)
- Supports, advises and influences global environmental agreements
- Formal technical advisor to the World Heritage Convention



IUCN RED LIST OF ECOSYSTEMS

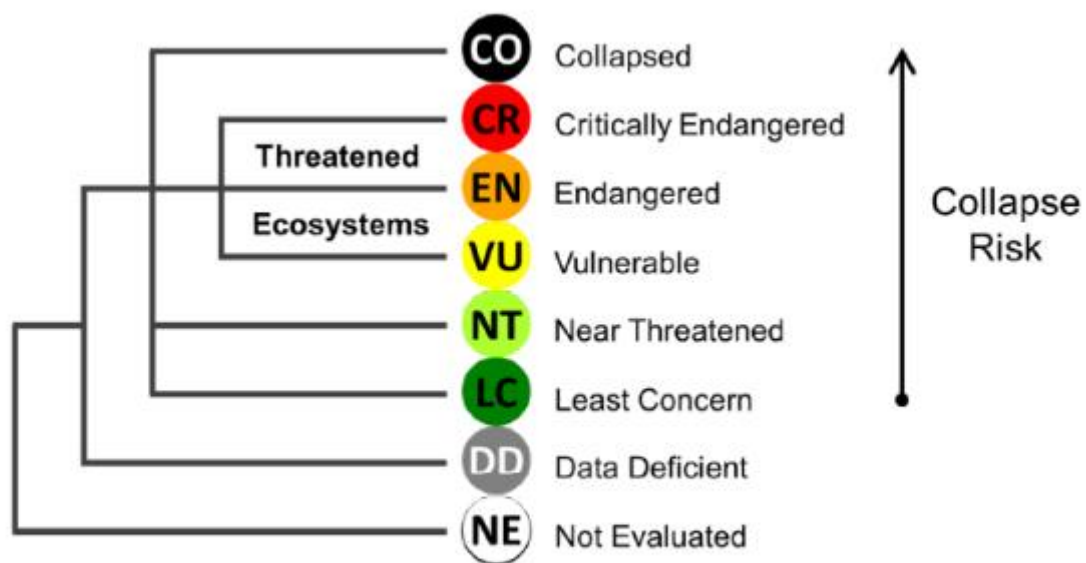
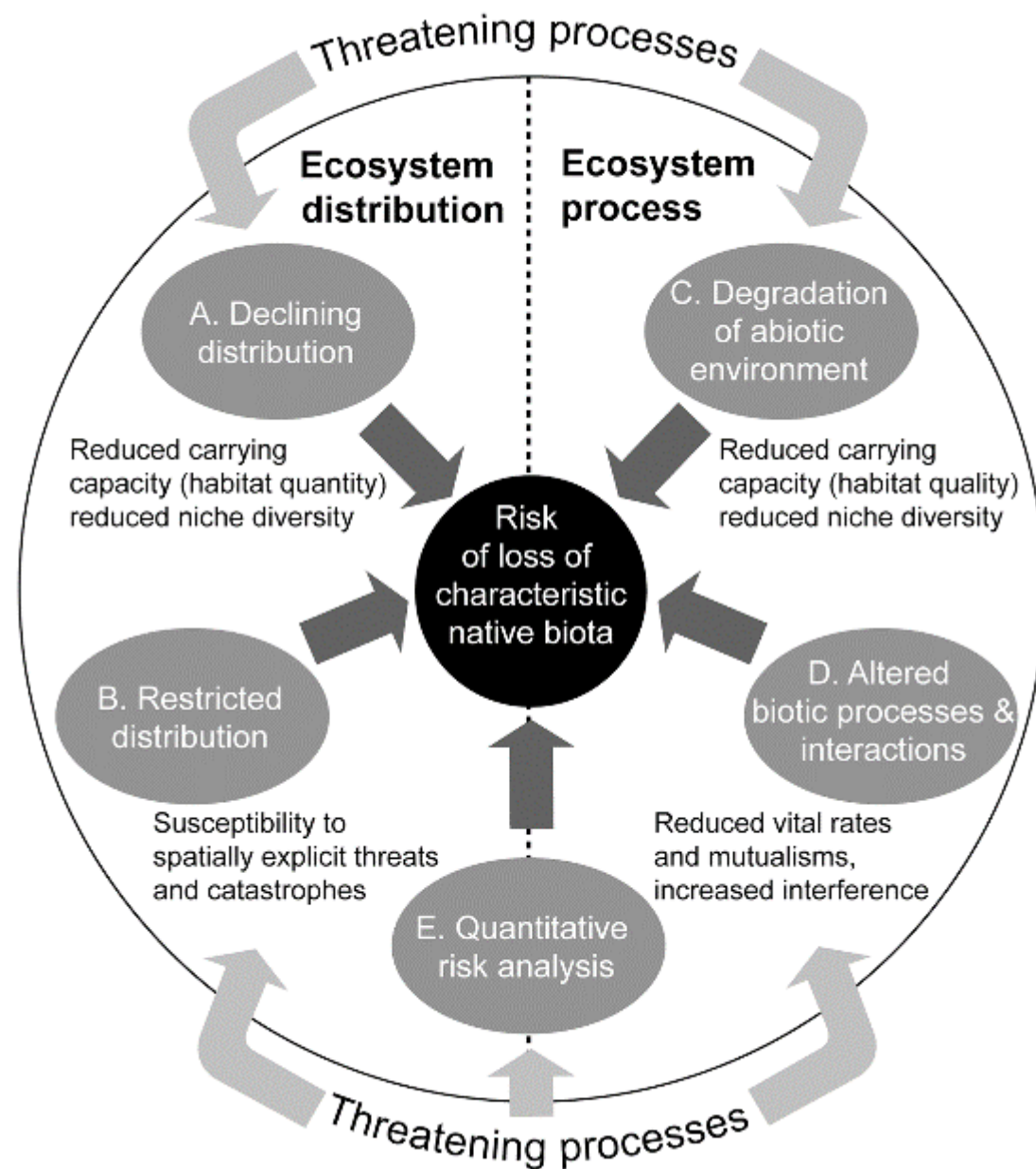


Figure 1. Structure of the IUCN Red List of Ecosystems categories.

iucnrl.org





GREEN LISTS

- IUCN resolved to create 3 ‘Green Lists’ in 2012
 - Green List of Protected Areas
 - Green List of Species
 - Green List of Ecosystems



“an agreed set of conservation standards is needed ... to systematically classify conservation and management success of species and ecosystems, thus recognizing and incentivizing conservation action”

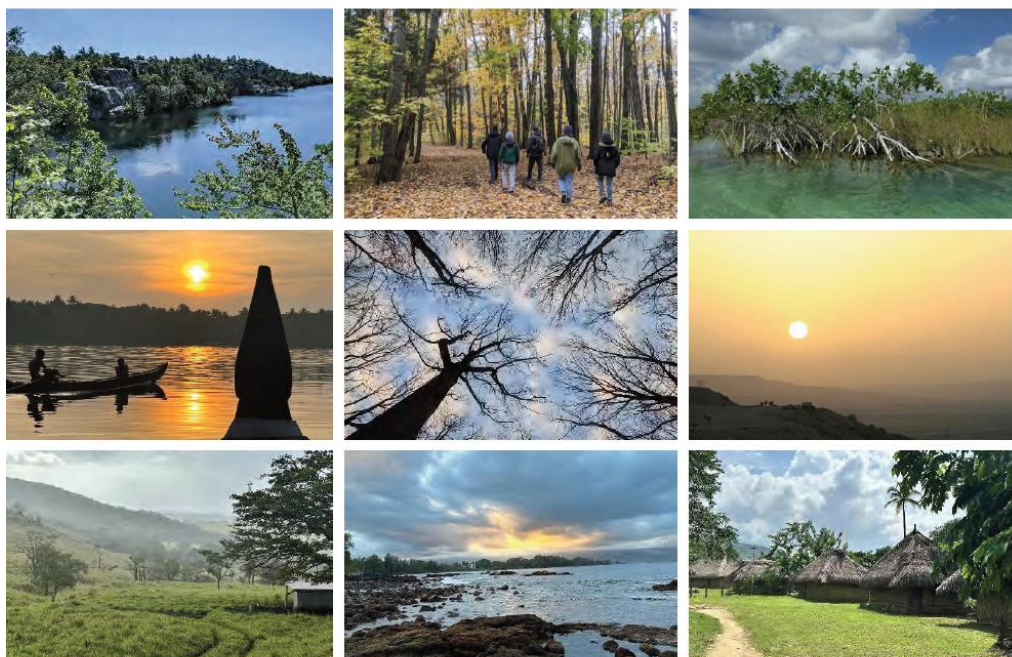
Green Status of
Ecosystems...
in development



Applying the IUCN Global Standard for Nature-based Solutions™

21 case studies from around the globe

Emmanuelle Cohen-Shacham, Edna Cabecinha, and Angela Andrade (Editors)



International Union for Conservation of Nature and Natural Resources



Standards, methods and guidelines for cross-referencing ecosystem classifications and maps to the IUCN Global Ecosystem Typology

IUCN Commission on Ecosystem Management
Red List of Ecosystems Thematic Group

Version 1.0



INTERNATIONAL UNION FOR CONSERVATION OF NATURE



Global Ecosystem Typology (GET)

- a framework for synthesis and sharing of knowledge to support ecosystem conservation, management and sustainable use from global to local scales
- provides a means of embedding these different systems into a globally consistent classification for ecosystems, while maintaining the integrity of the source classifications
- adopted as the agreed framework for monitoring progress on targets under the Kunming-Montreal Global Biodiversity Framework and as the reference classification for ecosystem assets in the System for Environmental Economic Accounting – Ecosystem Accounting.

<https://global-ecosystems.org>



Congress Document CGR-2025-2.5-1
Annex 1

Unite for Nature

On the path to 2045

DRAFT

Please note that the photos and layout
of this publication may be updated
in the run up to Congress,
but the text will not change

A 20-year
Strategic Vision
for the Union



Congress Document CGR-2025-3.1-1
Annex 1

Nature 2030

One nature, one future

DRAFT

The photographs and the layout
of this publication may be updated prior
to the Congress; however, the text content
will remain unchanged

IUCN Programme
2026–2029



IUCN's 3 IMPACT AREAS

IUCN will evolve and adapt to ensure it is

1.

Conserving biodiversity effectively.

2.

Addressing the interconnectedness between biodiversity, water, food, health, and climate change to ensure nature continues to support all life on the planet.

3.

Advancing a more **just and equitable society**.

“What” we will do

SCALE UP

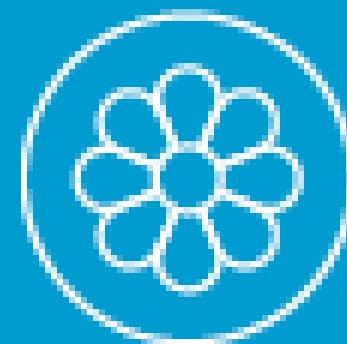
Five areas
for resilient and
sustainable
conservation
action



- Species-level conservation
- Effective area-based conservation
- Ecosystem conservation and restoration
- Addressing the nexus of nature and the multiple global changes facing the planet
- A rights- and equity-based approach to conservation action

TRANSFORM

Eight
transformational
focus areas for
nature and people



- Climate change adaption
- Alignment of financial and economic systems with nature
- Food systems and sustainable agriculture
- One Health
- Green, just energy transition
- Sustainable cities
- Regenerative blue economy
- Water stewardship and security

Conservation and production in forested landscapes

- Explore the opportunity spectrum for acting collectively
- Grow partnerships across sectors
- Move beyond the old battles and ideologies
- Focus on acting collectively (despite or perhaps because of the threats to multilateralism)
- Recognise the threats we are facing
- Reimagine how our financial and economic systems might (and should) transform into new models and drive change
- These are arenas where we can all make a difference

Finding and building common ground

- Shared Purpose
- Rationale
- Catalyst
- Willingness and Commitment to the journey
- Resources
- Inclusivity and transparency
- Think outside the box

