



POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH

Beyond Building Back Better - A Healthier and Greener World After COVID-19

Johan Rockström

Professor Earth System Science,
Director PIK

Member of



Prince Mahidol Award Conference 2021,
12 November 2020



'We can do it!': EU chief announces 55% emissions reduction target for 2030

By Frédéric Simon | EURACTIV.com

📅 16 Sep 2020 (updated: 📅 23 Sep 2020)



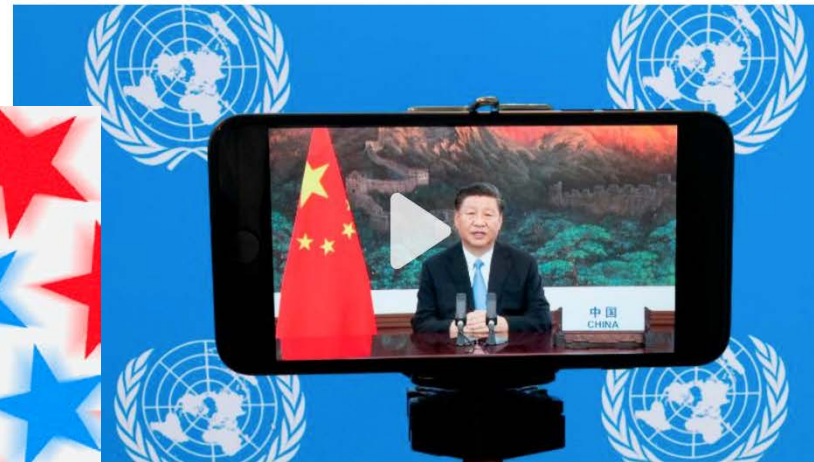
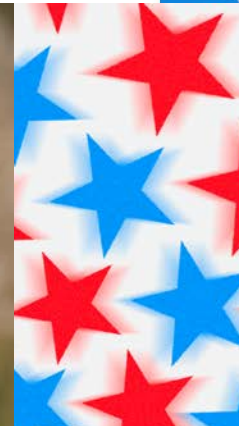
A banner for CNN Sport featuring a soccer player in a blue jersey celebrating. The text reads "More than a game. 24/7 coverage of the world's top stars" and "LATEST NEWS". Below the banner is a navigation bar with "World", "Africa", "Americas", "Asia", "Australia", "China", "Europe", "India", "Middle East", and "United Kingdom".

China will become carbon neutral by 2060, Xi Jinping says



By Helen Regan, CNN

🕒 Updated 0538 GMT (1338 HKT) September 23, 2020



News & buzz

-  Why everyone should have seen this coming from Lindsey Graham
-  Opinion: Mitch McConnell is going to turn me into a socialist

Ad Singular



Joe Biden could bring Paris climate goals 'within striking distance'

▲ Joe Biden speaks out about climate change and Semanskv/AP

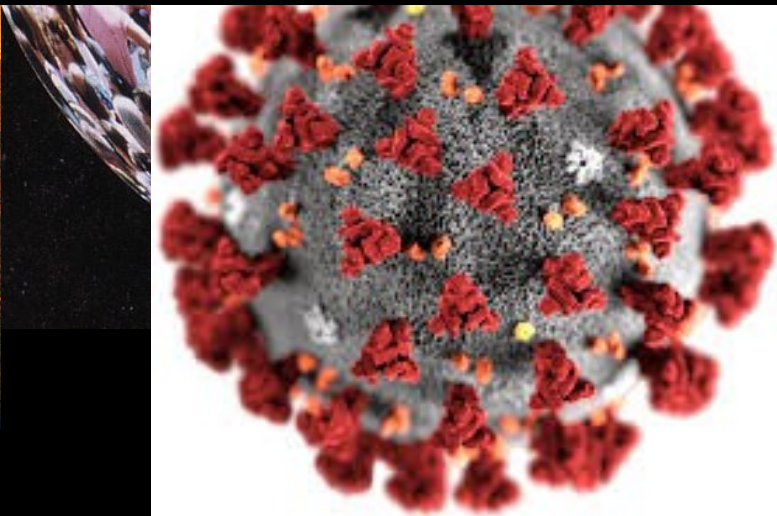
A biosphere shaped by humans



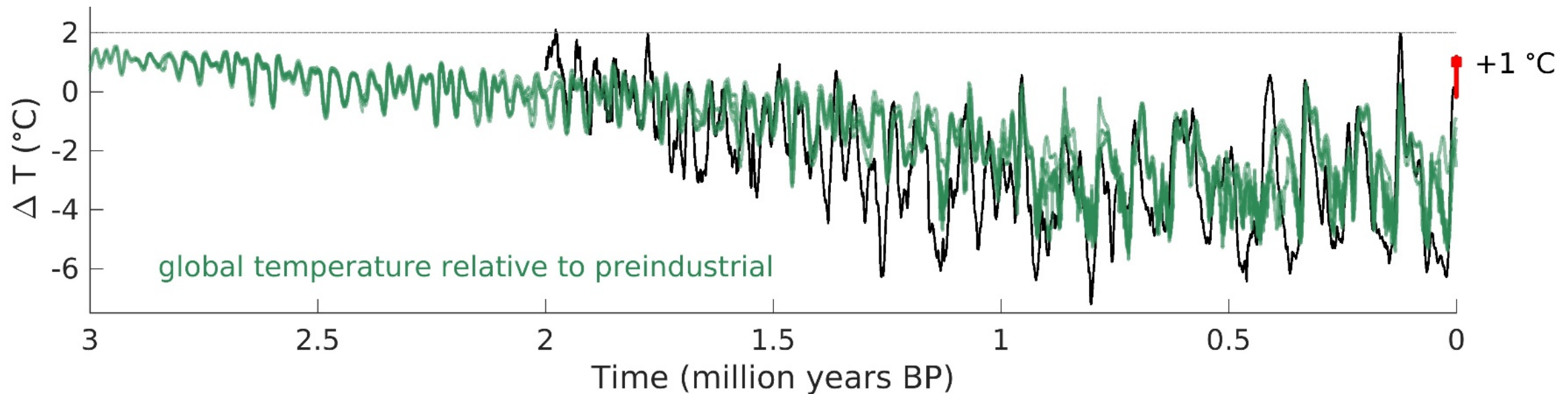
Anthropocene



Scale, Speed, Inter-connections



We have never exceeded 2 C in the last Three Million Years



Results of model simulations: Observations shown in black, model results in colour.

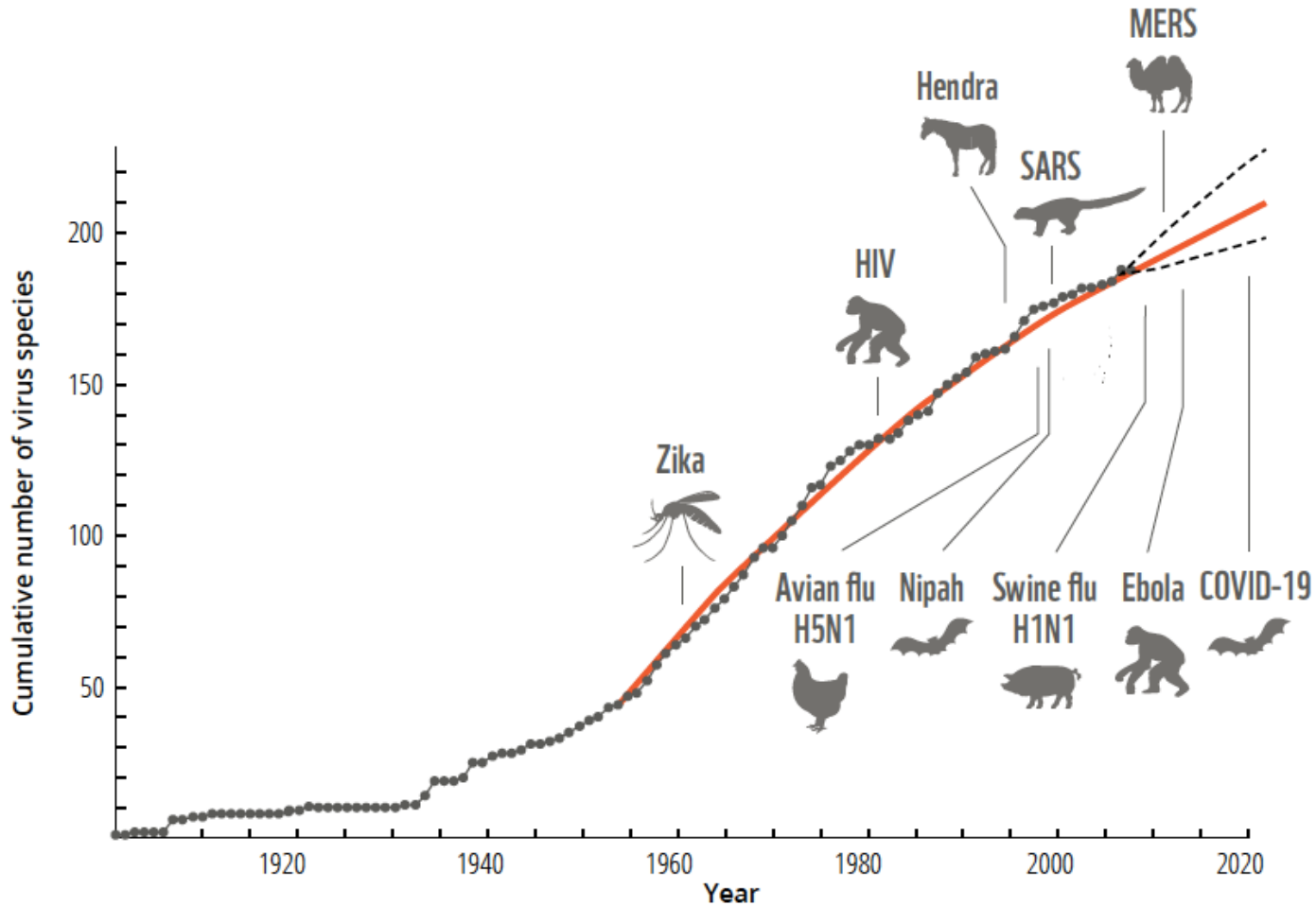
Climate Crisis



Health Crisis

Ecosystem Crisis

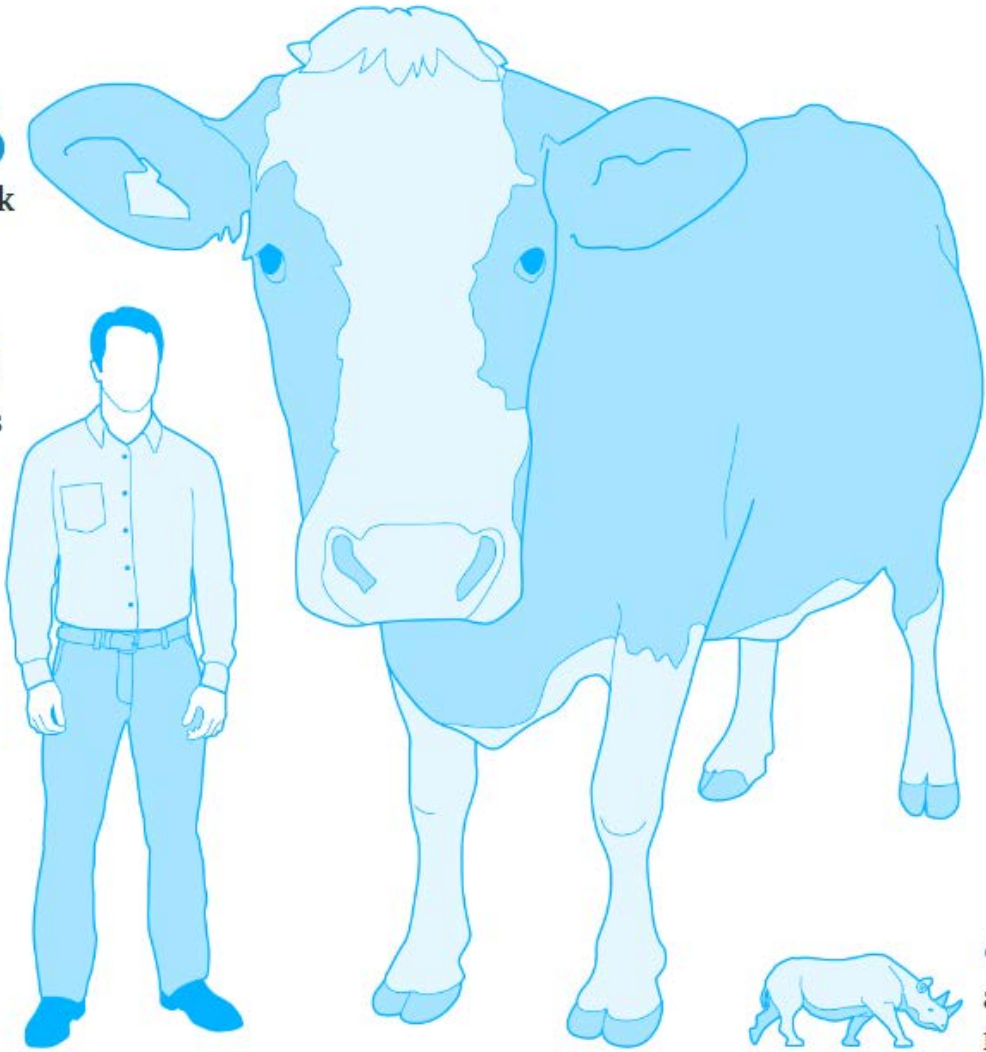
Zoonotic Virus diseases on the rise



Of all the mammals on Earth, 96% are livestock and humans, only 4% are wild mammals

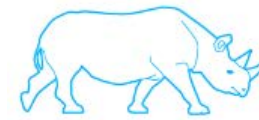
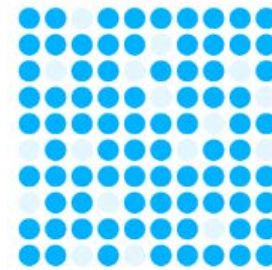
60%
are livestock

36%
are humans



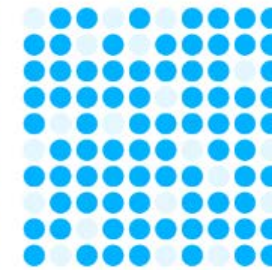
Since the rise of human civilisation 83% of wild mammals have been lost

83%



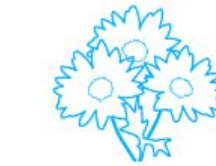
of wild mammals

80%



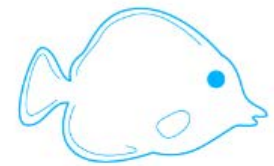
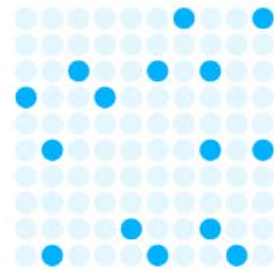
of marine mammals

50%



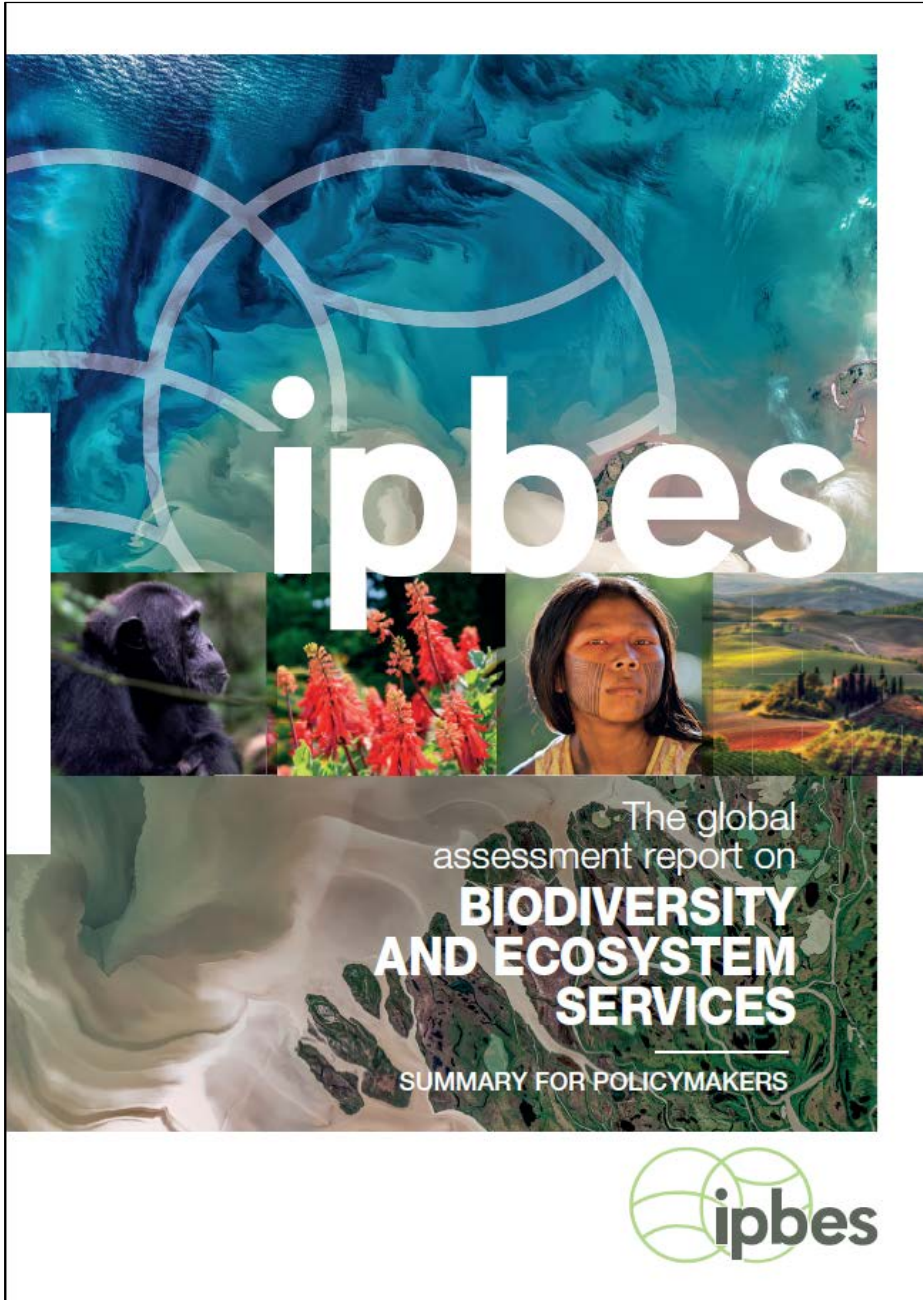
of plants

15%



of fish

4%
are wild mammals



Key Messages:

- A. Nature and its vital contributions to people, which together embody biodiversity and ecosystem functions and services, are deteriorating worldwide.
- B. Direct and indirect drivers of change have accelerated during the past 50 years.
- C. Goals for conserving and sustainably using nature and achieving sustainability cannot be met by current trajectories, and goals for 2030 and beyond may only be achieved through transformative changes across economic, social, political and technological factors.
- D. Nature can be conserved, restored and used sustainably while other global societal goals are simultaneously met through urgent and concerted efforts fostering transformative change.

NEWS

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[Asia](#) | [China](#) | [India](#)

Coronavirus: 'India must cut pollution to avoid Covid disaster'

By **Vikas Pandey**
BBC News, Delhi

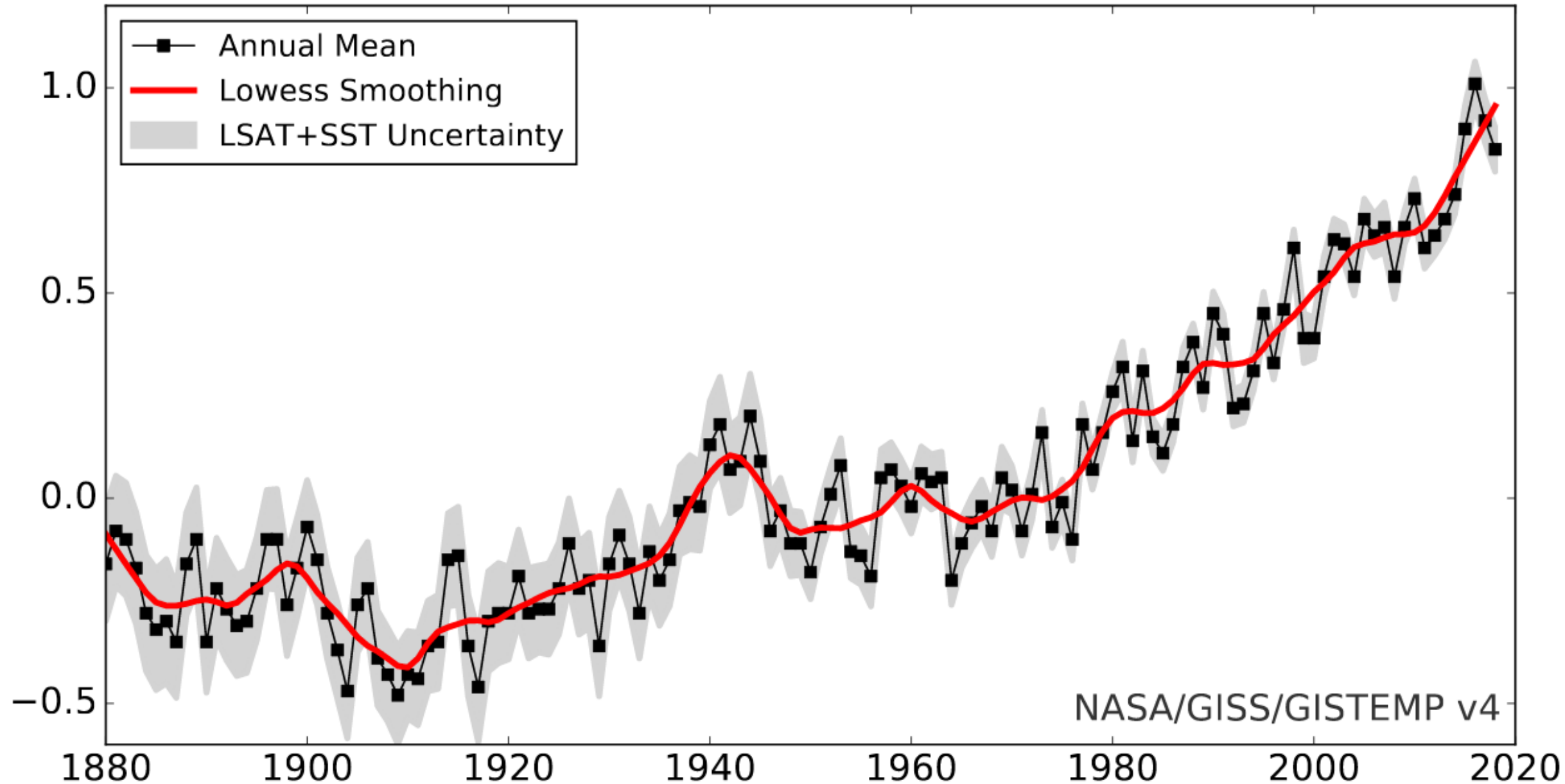
🕒 15 hours ago



Air quality has deteriorated in Delhi in recent weeks

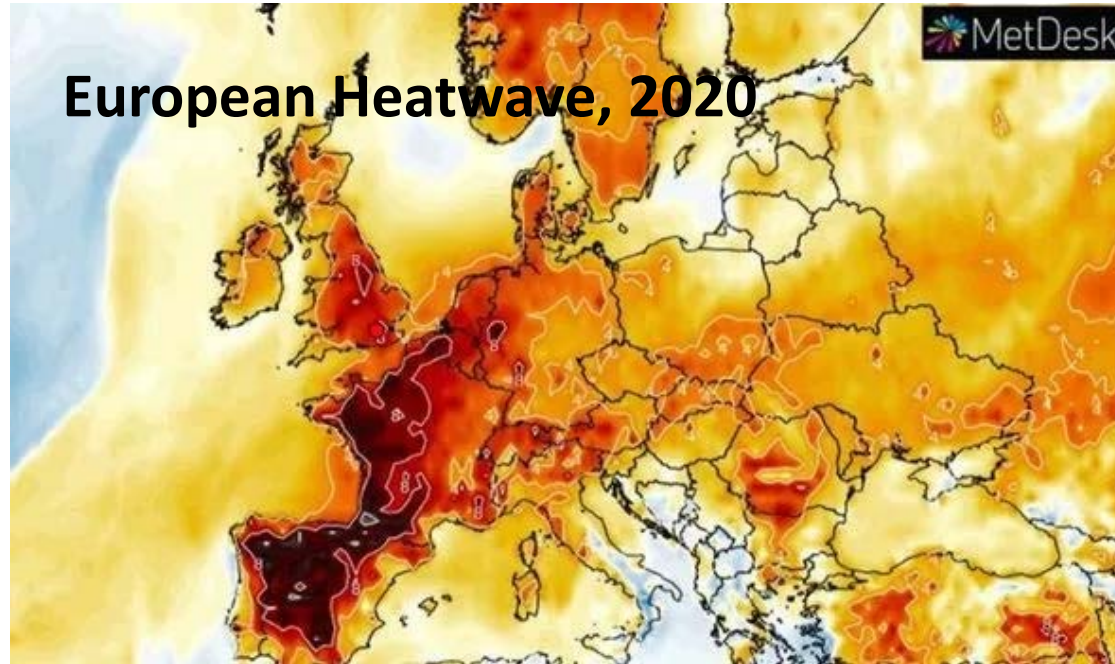
Global Mean Estimates based on Land and Ocean Data

Temperature Anomaly w.r.t. 1951-80 (°C)



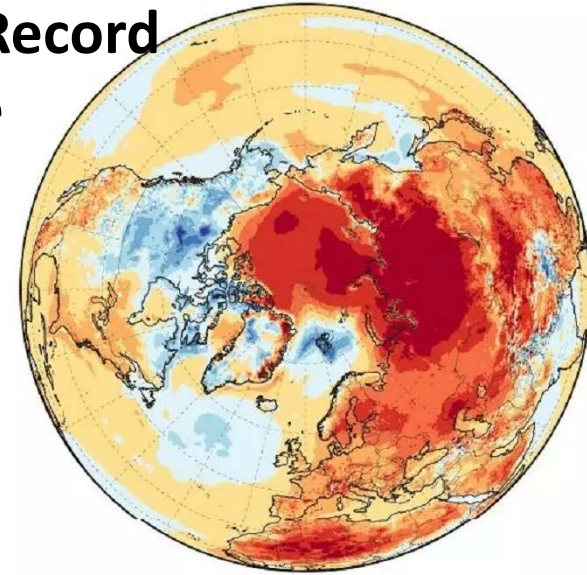
NASA/GISS/GISTEMP v4

Unsafe territory: Extreme events in 2020



Global near-surface temperature anomaly January - June 2020 (°C)
NCEP GFS analysis relative to CFSR climatology 1981-2010

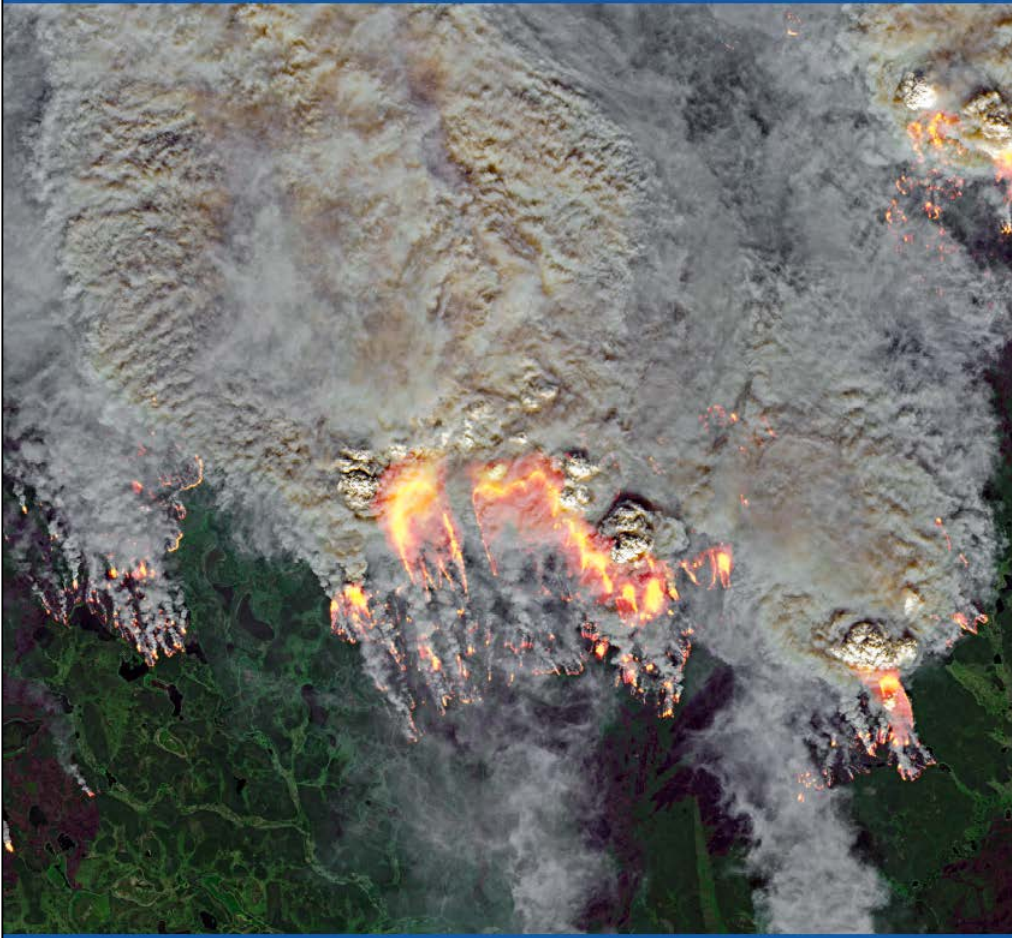
Siberia's Record Heatwave





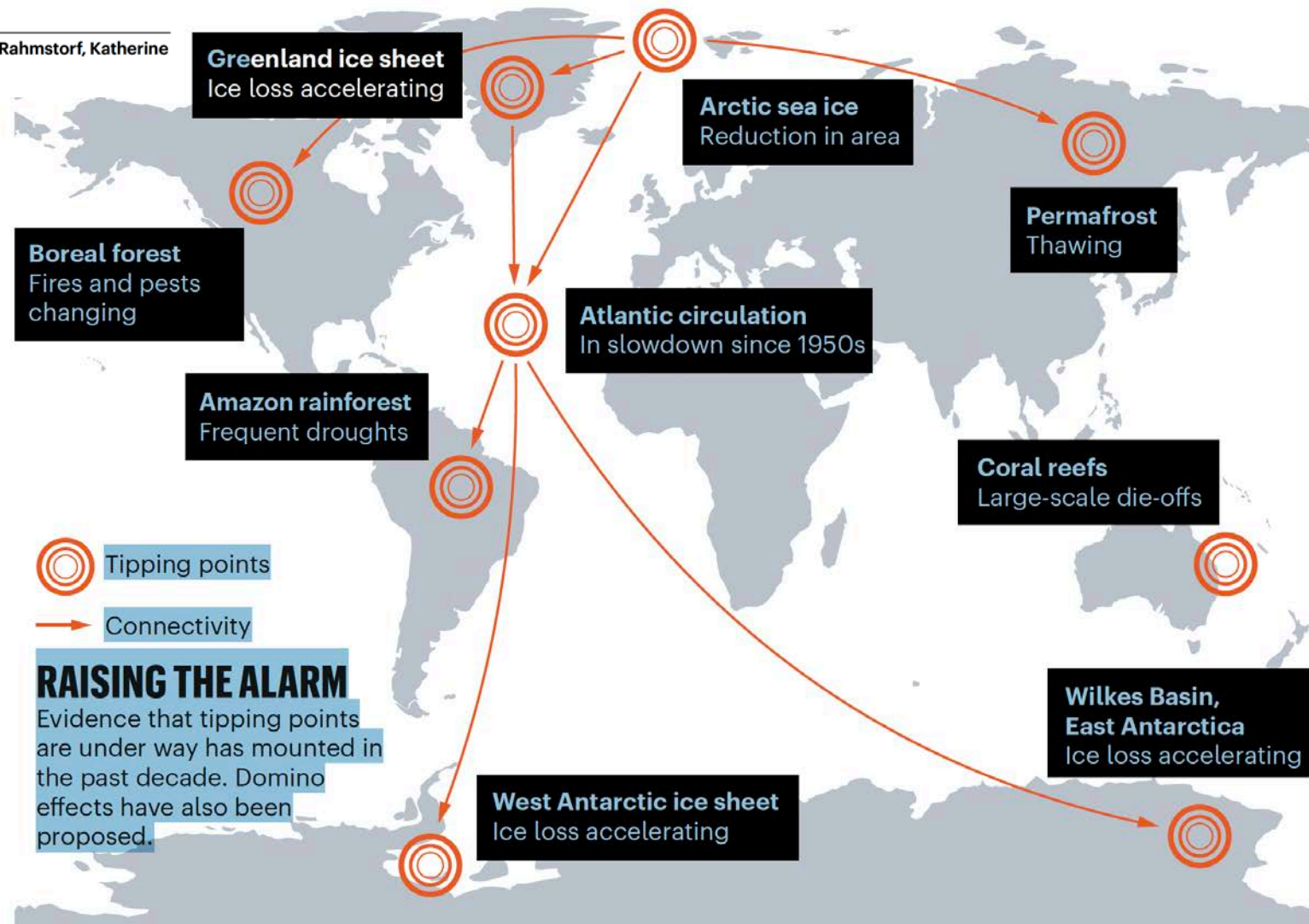
United in Science 2020

A multi-organization high-level compilation of the latest climate science information

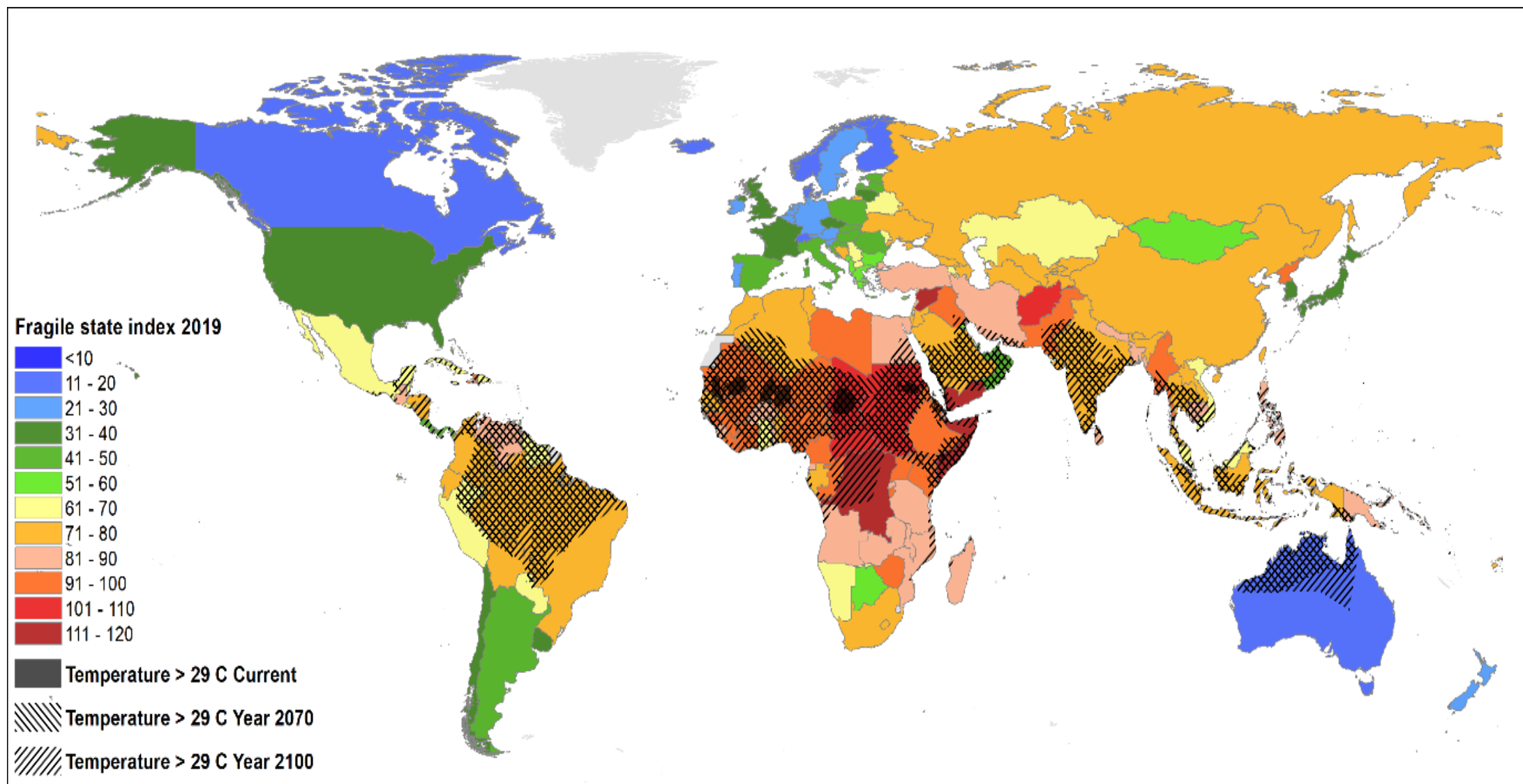


Climate tipping points – too risky to bet against

Timothy M. Lenton, Johan Rockström, Owen Gaffney, Stefan Rahmstorf, Katherine Richardson, Will Steffen & Hans Joachim Schellnhuber

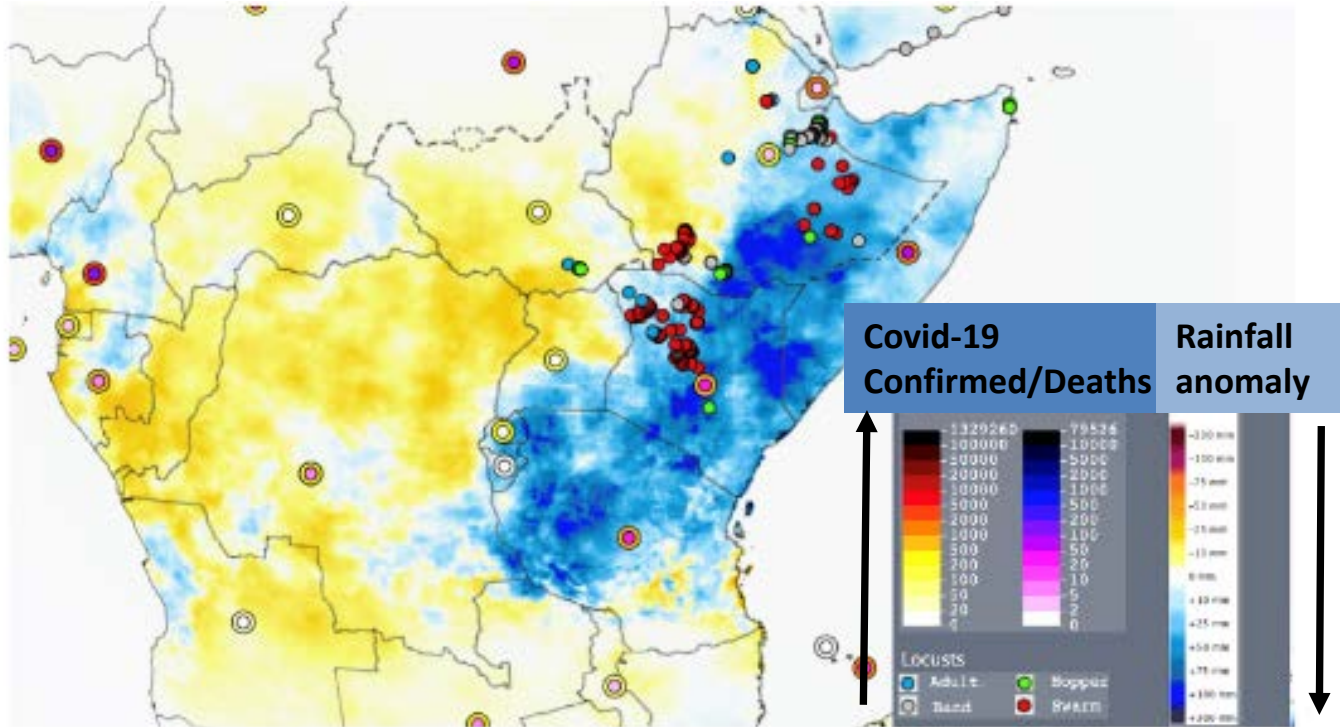


SOURCE: T. M. LENTON ET AL.



A Perfect Storm in East Africa?

UN (2020): The Impact of COVID-19 on Food Security and Nutrition



Source: FAO/Desert Locust Watch, Johns Hopkins CSSE /COVID-19 Data Repository, CHRIPS (Climate Hazards Group InfraRed Precipitation with Station data)



<https://www.theguardian.com/world/gallery/2020/jan/24/billions-of-locusts-swarm-through-kenya-in-pictures>

- A “Triple Menace”: Covid-19, Locusts And Heavy Rains

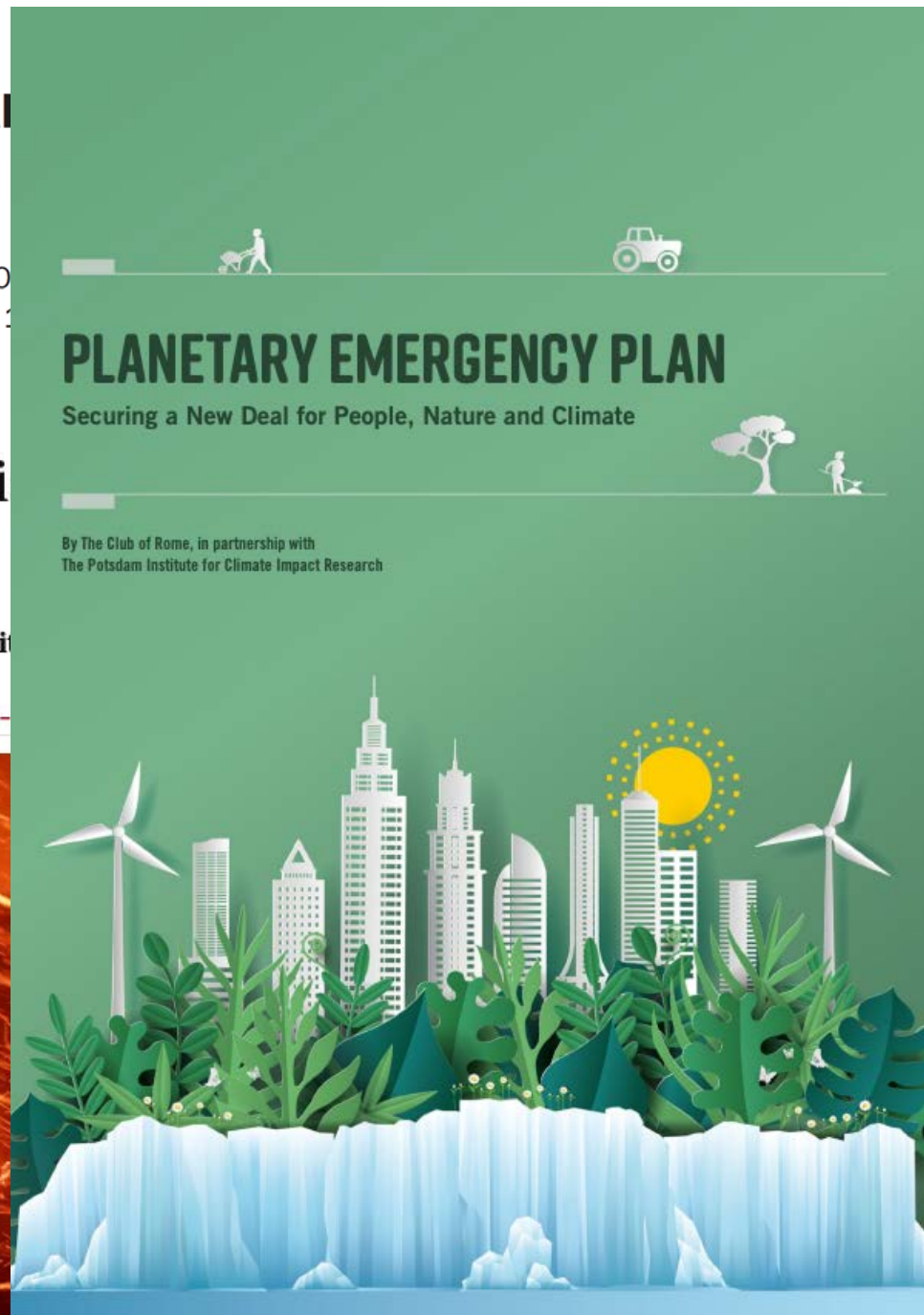
World Scientists' Warning

WILLIAM J. RIPPLE, CHRISTOPHER WOLF, THOMAS
AND 11,258 SCIENTIST SIGNATORIES FROM 150

Climate crisis: 11,000 scientists 'untold suffering'

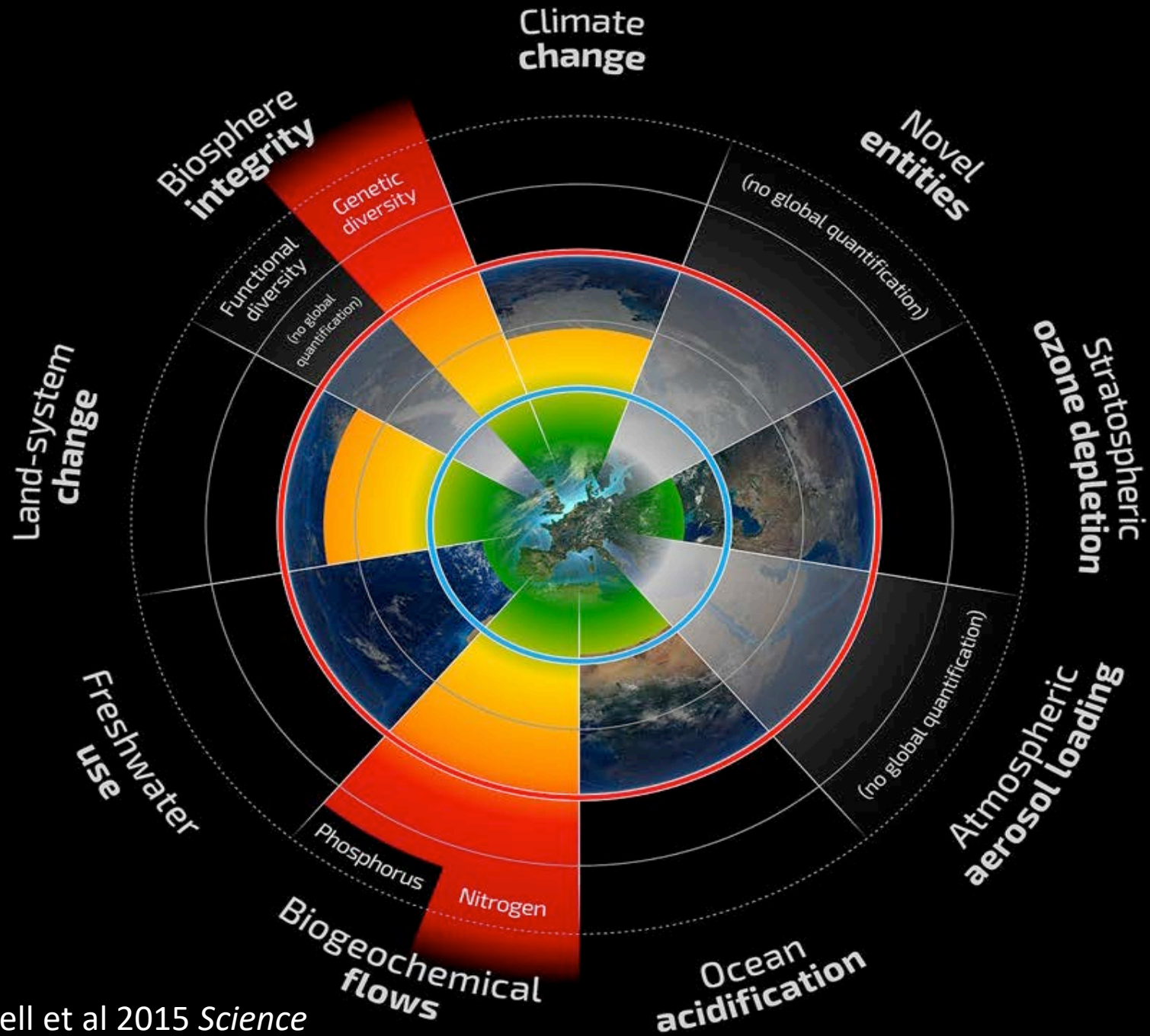
Statement sets out 'vital signs' as indicators of magnitude
climate emergency

● **Most countries' climate plans 'totally inadequate'** –



in 1,180 jurisdictions and local
citizens

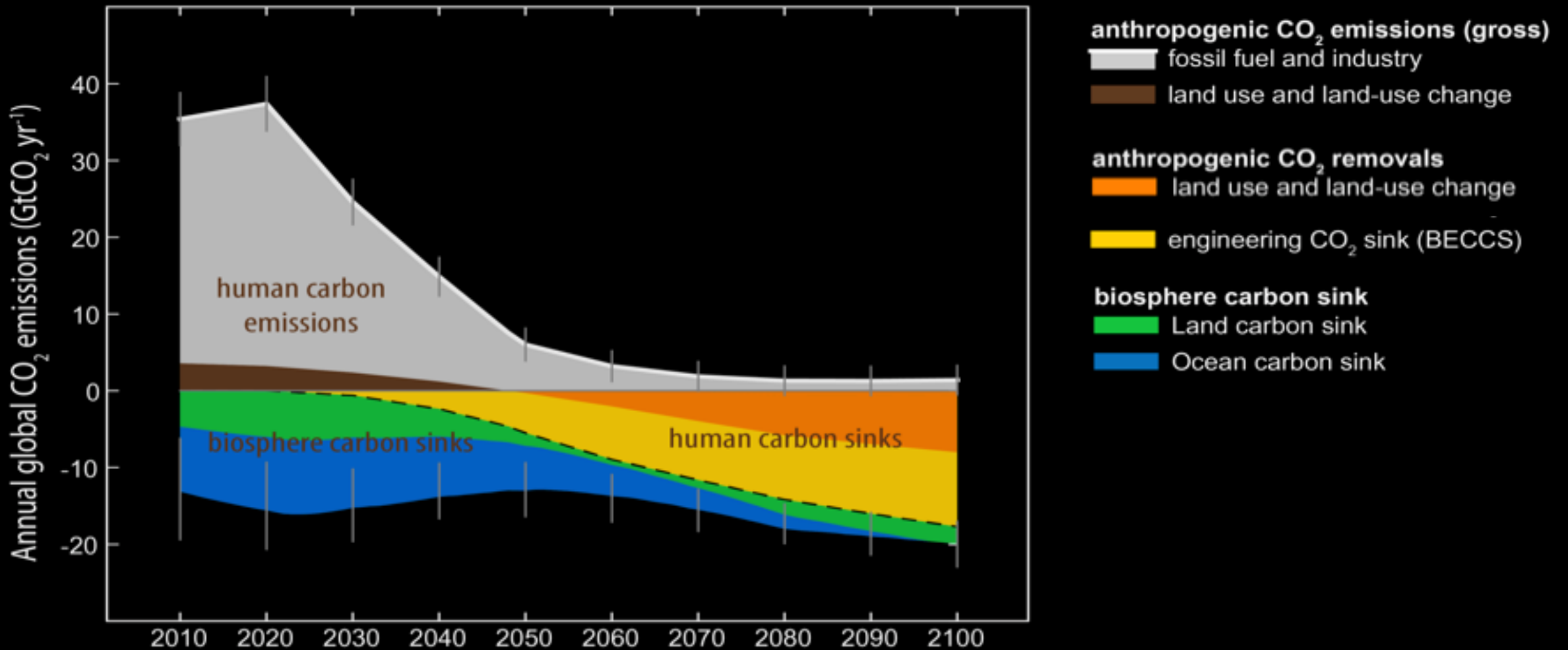




Steffen, Rockström, Cornell et al 2015 *Science*

Image: Globaia

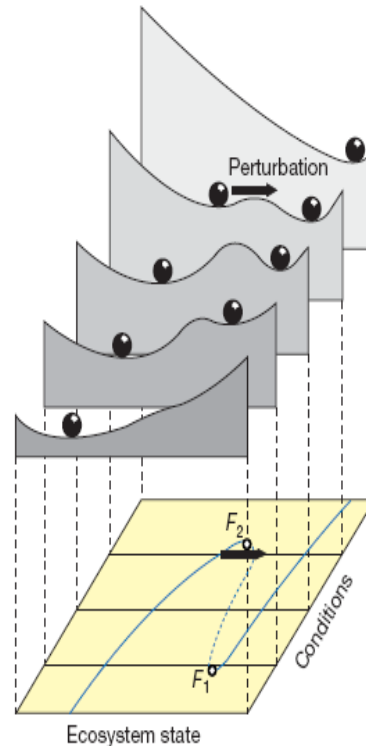
A Roadmap for Rapid Decarbonization



RESILIENCE

Resilience is the capacity of a system to continually change and adapt yet remain within critical thresholds.

- **Persistence** - capacity of a SES to continually change and adapt yet remain within critical thresholds.
- **Adaptability** - capacity to adjust responses to changing external drivers and internal processes and thereby allow for development along the current trajectory (stability domain).
- **Transformability** - capacity to cross thresholds into new development trajectories.
- interrelate *across multiple scales*.



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Synthesis

Social-ecological resilience and biosphere-based sustainability science

Carl Folke^{1,2}, *Reinette Biggs*^{1,3}, *Albert V. Norström*¹, *Belinda Reyers*¹ and *Johan Rockström*¹

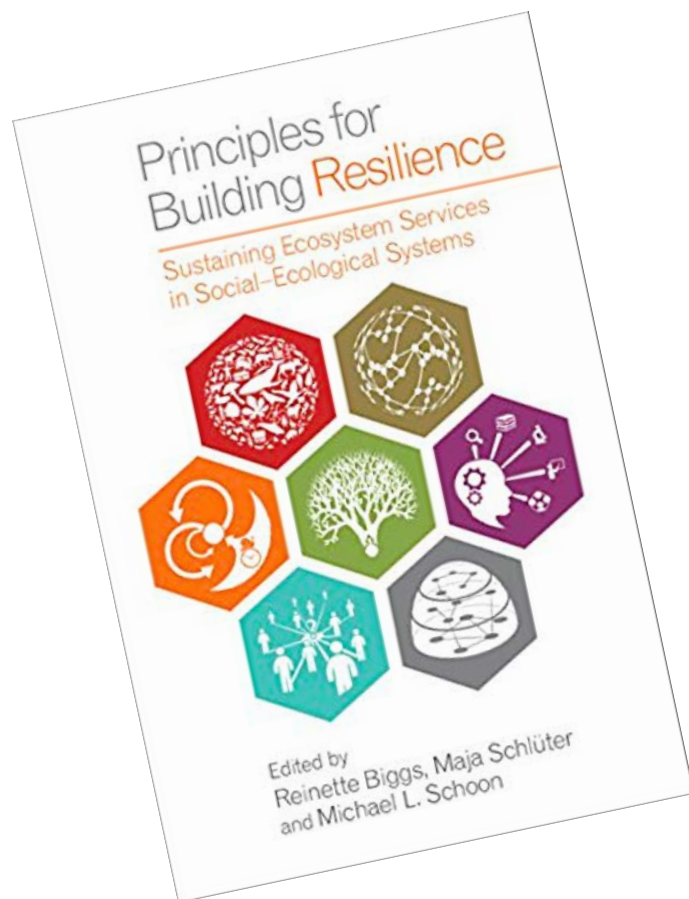
Principles for Building Resilience
Sustaining ecosystem services in social-ecological systems



CAMBRIDGE

Reinette (Oonsie) Biggs, Maja Schlüter, Michael Schoon (Eds)

Erin Bohensky, Georgina Cundill, Vasilis Dakos, Karen Kotschy, Anne Leitch, Allyson Quinlan, Marty Anderies, Derek Armitage, Jacopo Baggio, Elena Bennett, Duan Biggs, Örjan Bodin, Katrina Brown, Shauna BurnSilver, Tim Daw, Nathan Engle, Louisa Evans, Christo Fabricius, Carl Folke, Victor Galaz, Line Gordon, Chanda Meek, Garry Peterson, Ciara Raudsepp-Hearne, Martin Robards, Lisen Schultz, Brian Walker, Paul West







Resilience Attribute	Interventions to build resilience
Diversity	<ul style="list-style-type: none"> Diverse Economic Opportunities Diverse energy systems Halt loss of biodiversity Integrated food systems Food diversity
Redundancy	<ul style="list-style-type: none"> Universal social safety Informal networks Ecological safety nets Credit access Reserves along supply chains
Inclusivity and Equity	<ul style="list-style-type: none"> Access finance to local communities/low income Wealth redistribution Social and Health safety nets
Connectivity and Modularity	<ul style="list-style-type: none"> Local food production Digital connectivity Decentralise and modularize energy systems Community connectivity
Adaptive learning	<ul style="list-style-type: none"> Adaptive decision-making based on multiple scenarios Maintain memory of responses Invest in learning along science-policy-business-community



SYSTEMS TRANSFORMATION RACE TO ZERO DIALOGUES

Emerging from the planetary emergency



Organised by the Club of Rome
and the Potsdam Institute for
Climate Impact Research



9 November 2020



COUNTDOWN

To a healthier future

RACE TO ZERO

1,101 Businesses

452 Cities

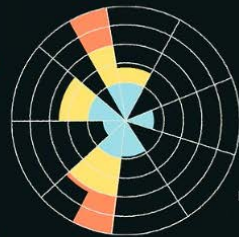
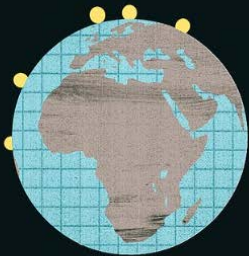
45 Investors

22 Regions

549 Universities

TED Ideas worth spreading

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Johan Rockström | Countdown

10 years to transform the future of humanity — or destabilize the planet

7:38



United Nations
Climate Change

A Safe Operating Space for Humanity





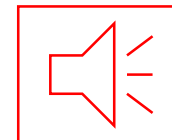
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by our climate scientists!**