



POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH

A Planetary Emergency

Johan Rockström

Professor Earth System Science,

Director PIK

Member of



**Globe EU Wake-up Call,
04 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)

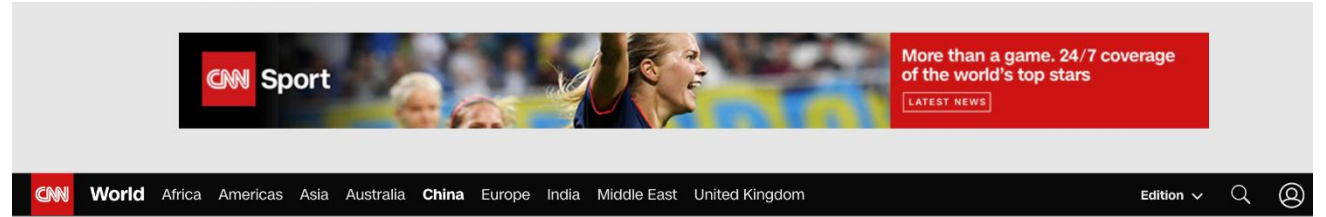


Trump at the UN: America is good

The president portrayed the US as a benevolent, responsible world leader — and China as the world's aggressor.

By Alex Ward | @AlexWardVox | alex.ward@vox.com | Sep 22, 2020, 11:10am EDT

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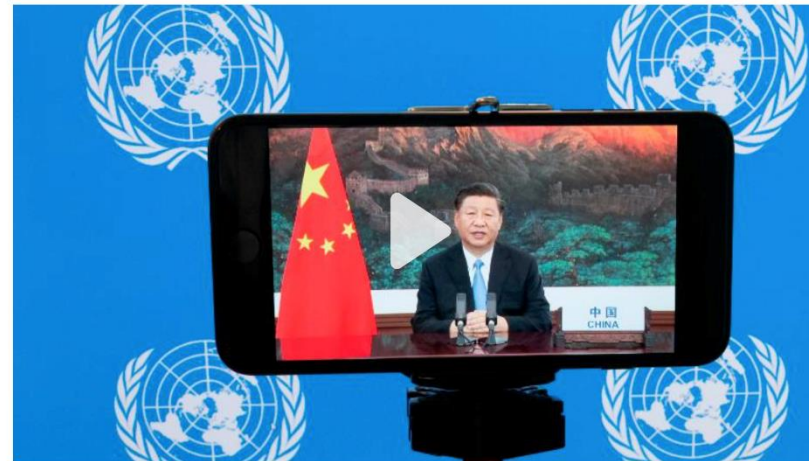


China will become carbon neutral by 2060, Xi Jinping says



By Helen Regan, CNN

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



News & buzz



Why everyone should have seen this coming from Lindsey Graham

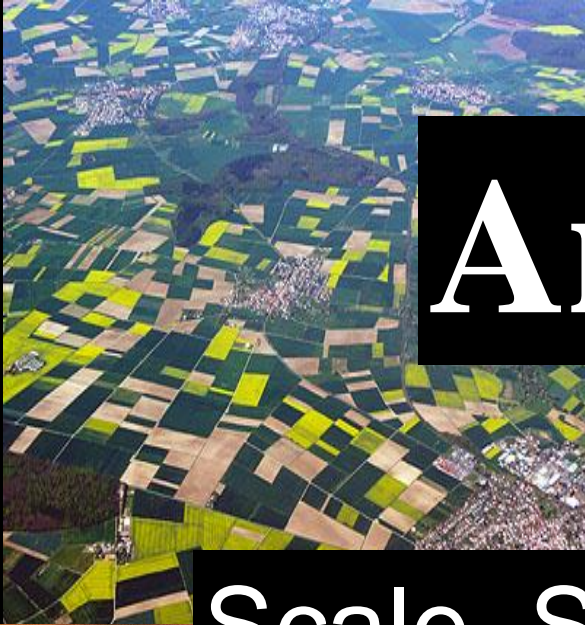


Opinion: Mitch McConnell is going to turn me into a socialist

Ad Singular

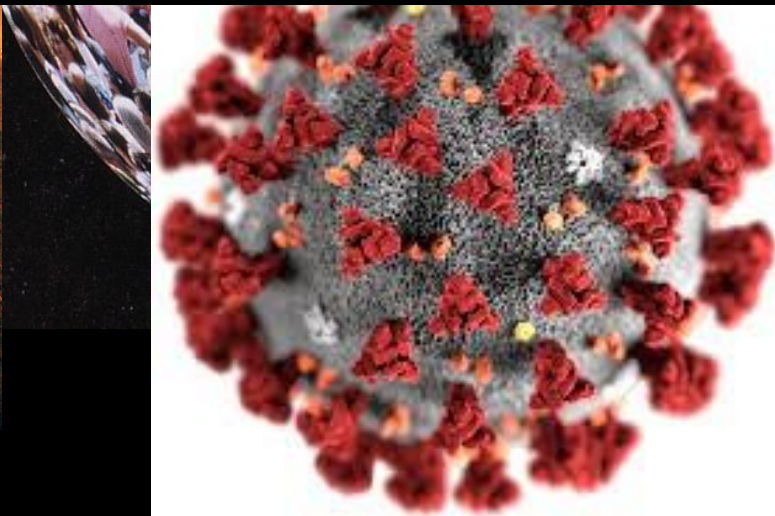


A biosphere shaped by humans



Anthropocene

Scale, Speed, Inter-connections



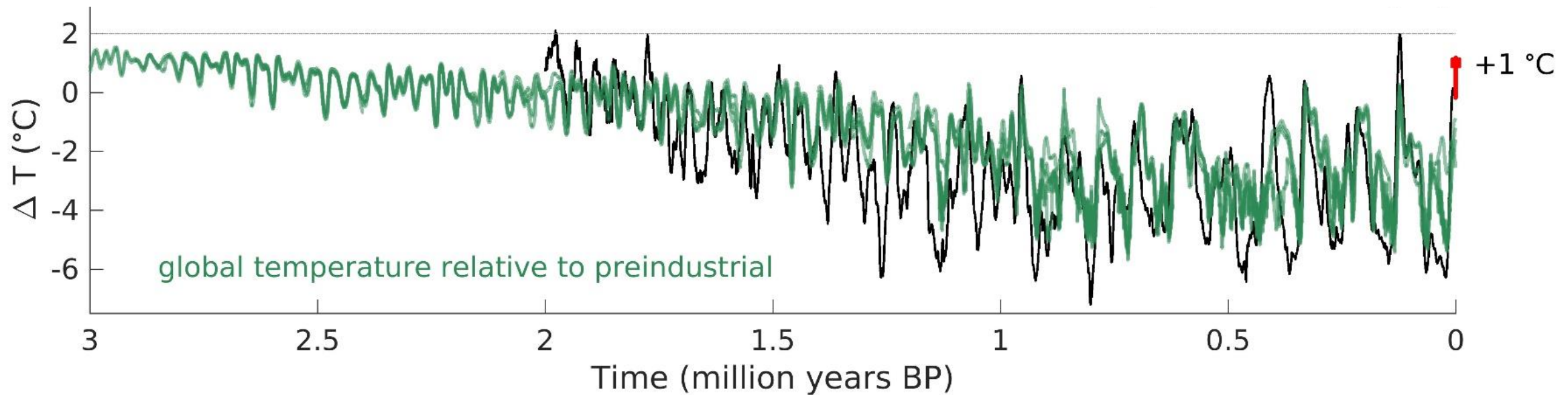
Climate Crisis



Health Crisis

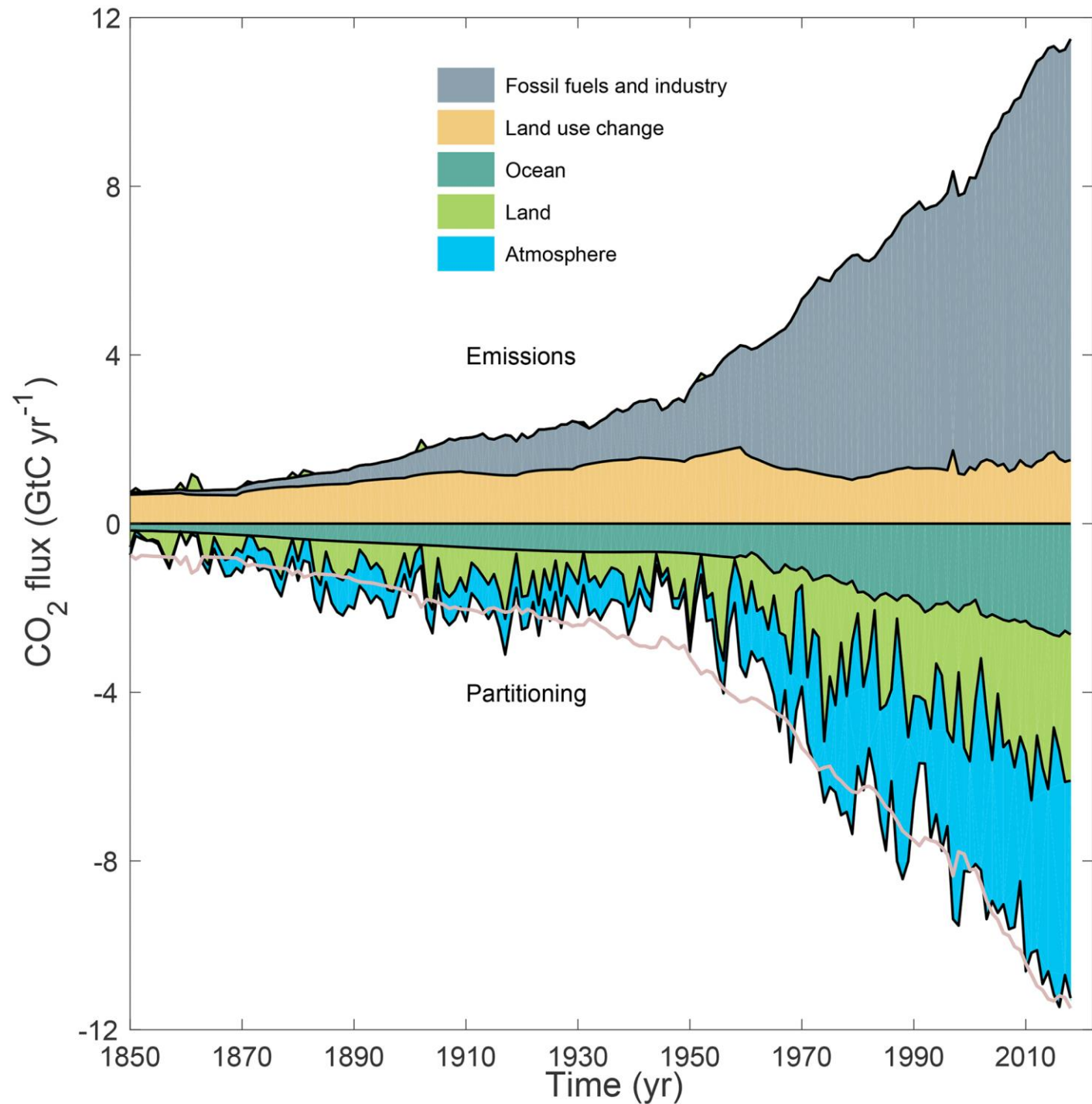
Ecosystem Crisis

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

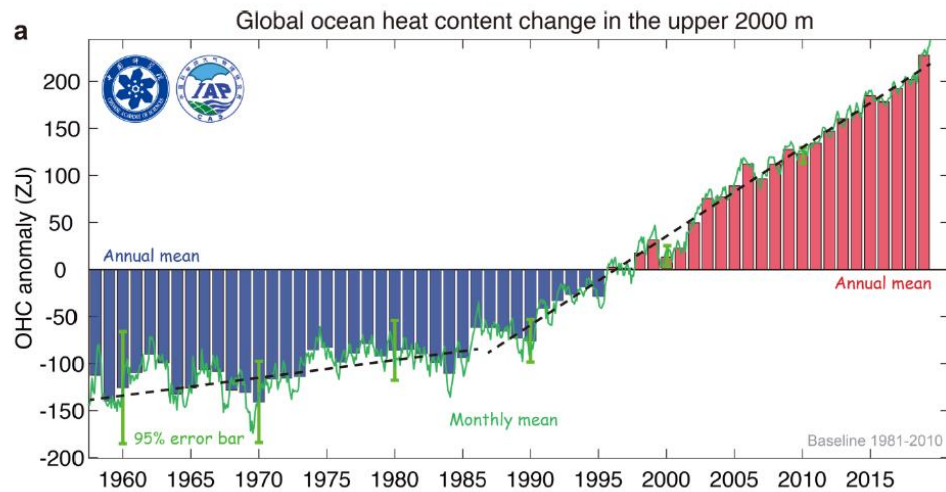


Results of model simulations: Observations shown in black, model results in colour.

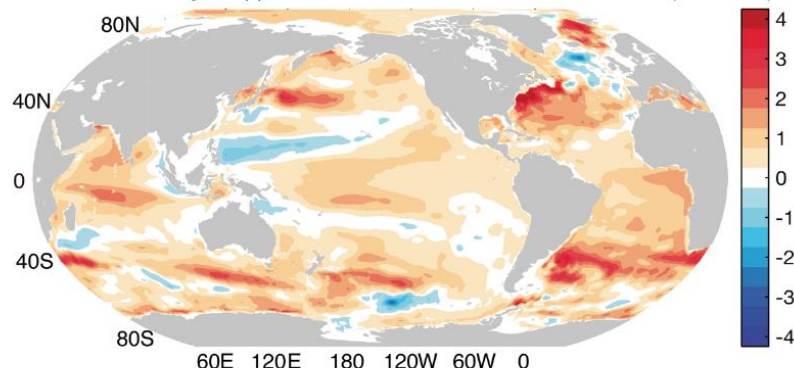
Global Carbon Budget 2019



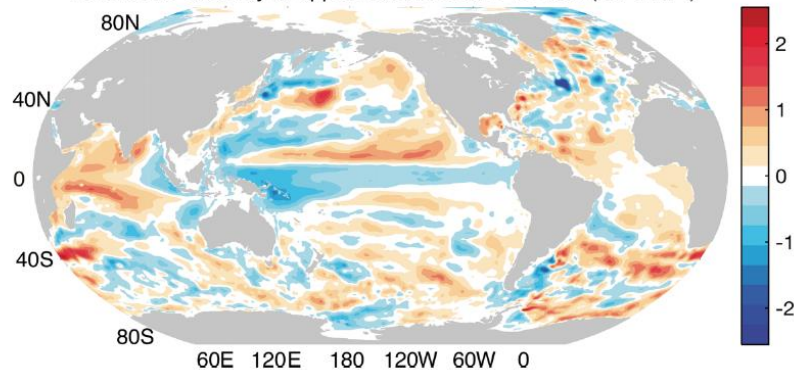
Record-Setting Ocean Warmth Continued in 2019



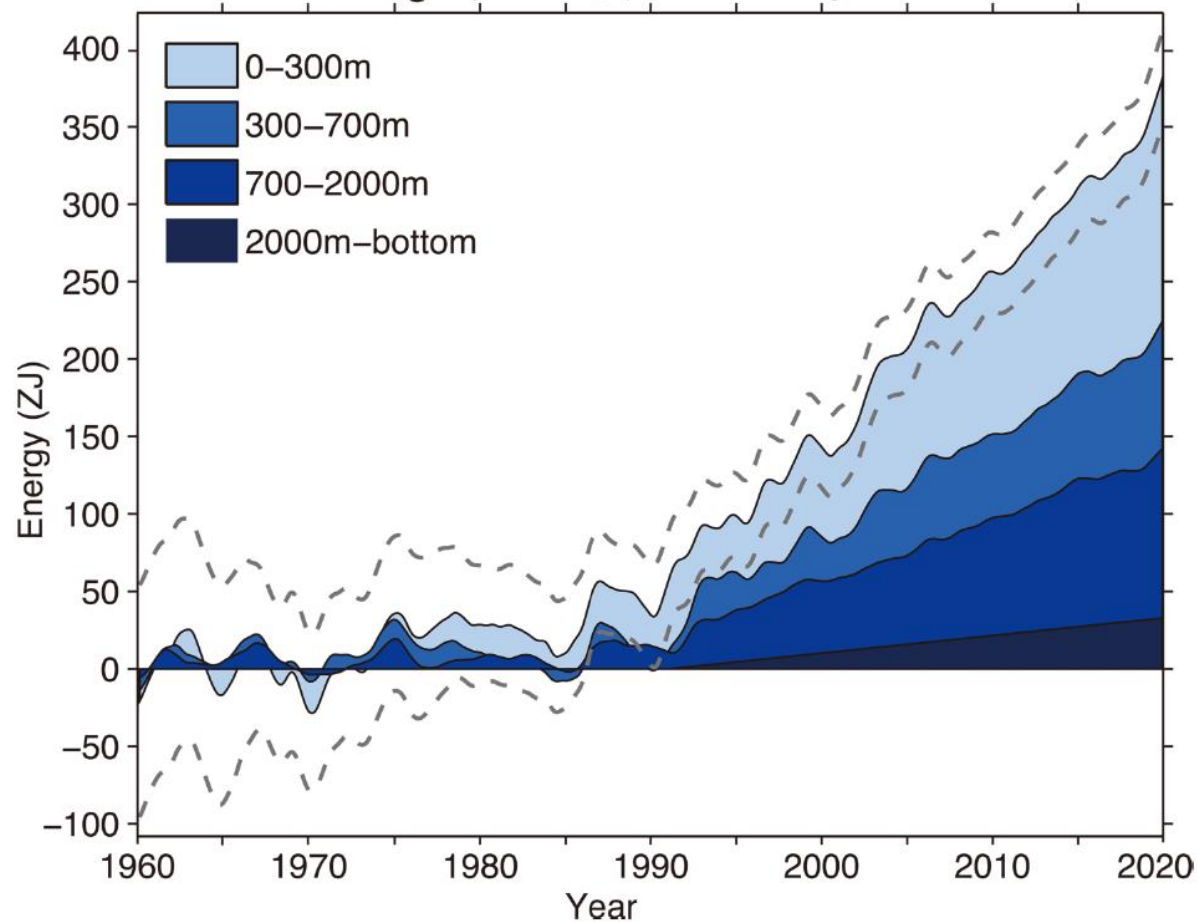
b 2019 OHC anomaly at upper 2000m relative to 1981-2010 baseline (10^9 J m^{-2})



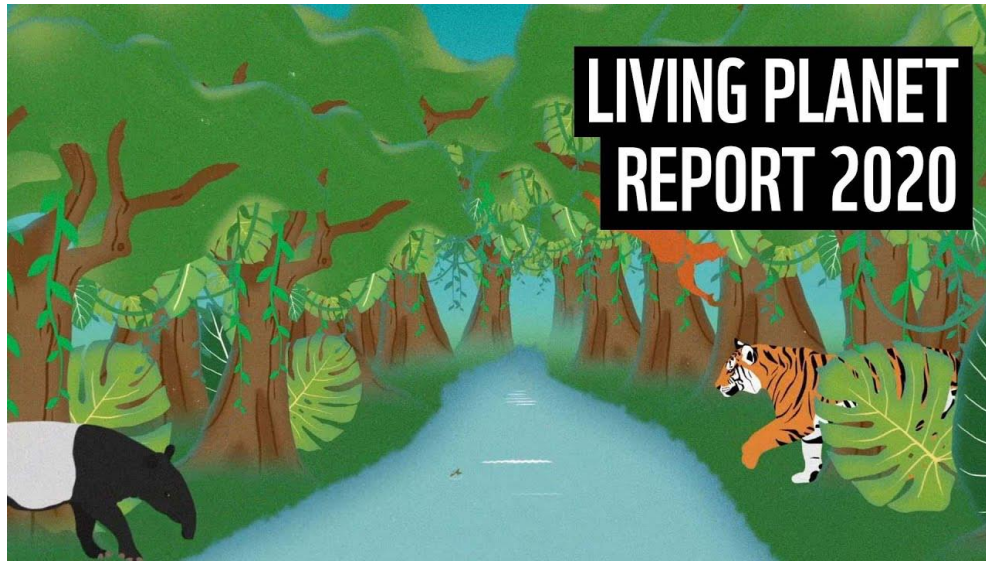
c 2019 OHC anomaly at upper 2000m relative to 2018 (10^9 J m^{-2})



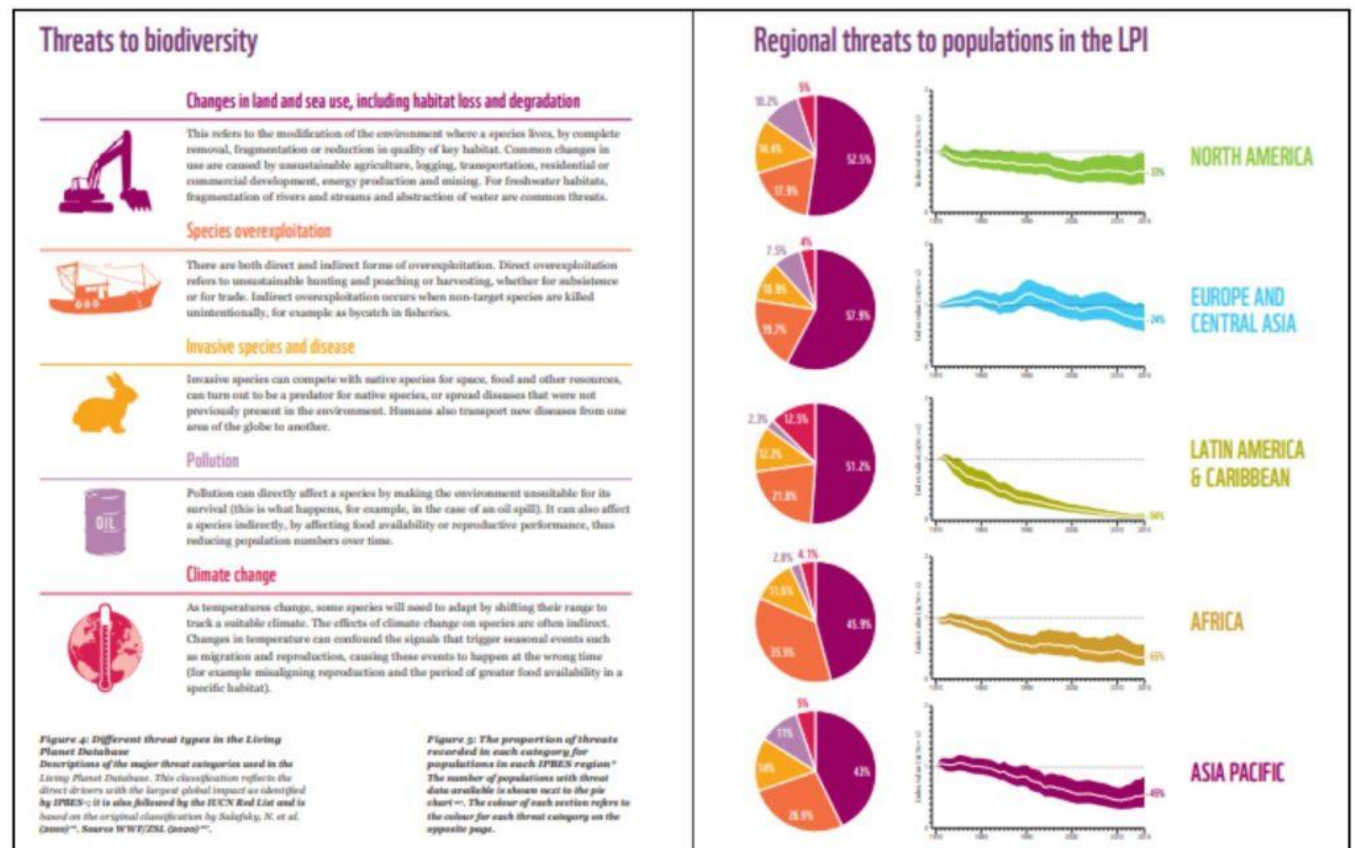
Ocean Heat Budget (1960-2019, updated from Cheng et al. 2017 Sci. Adv.)



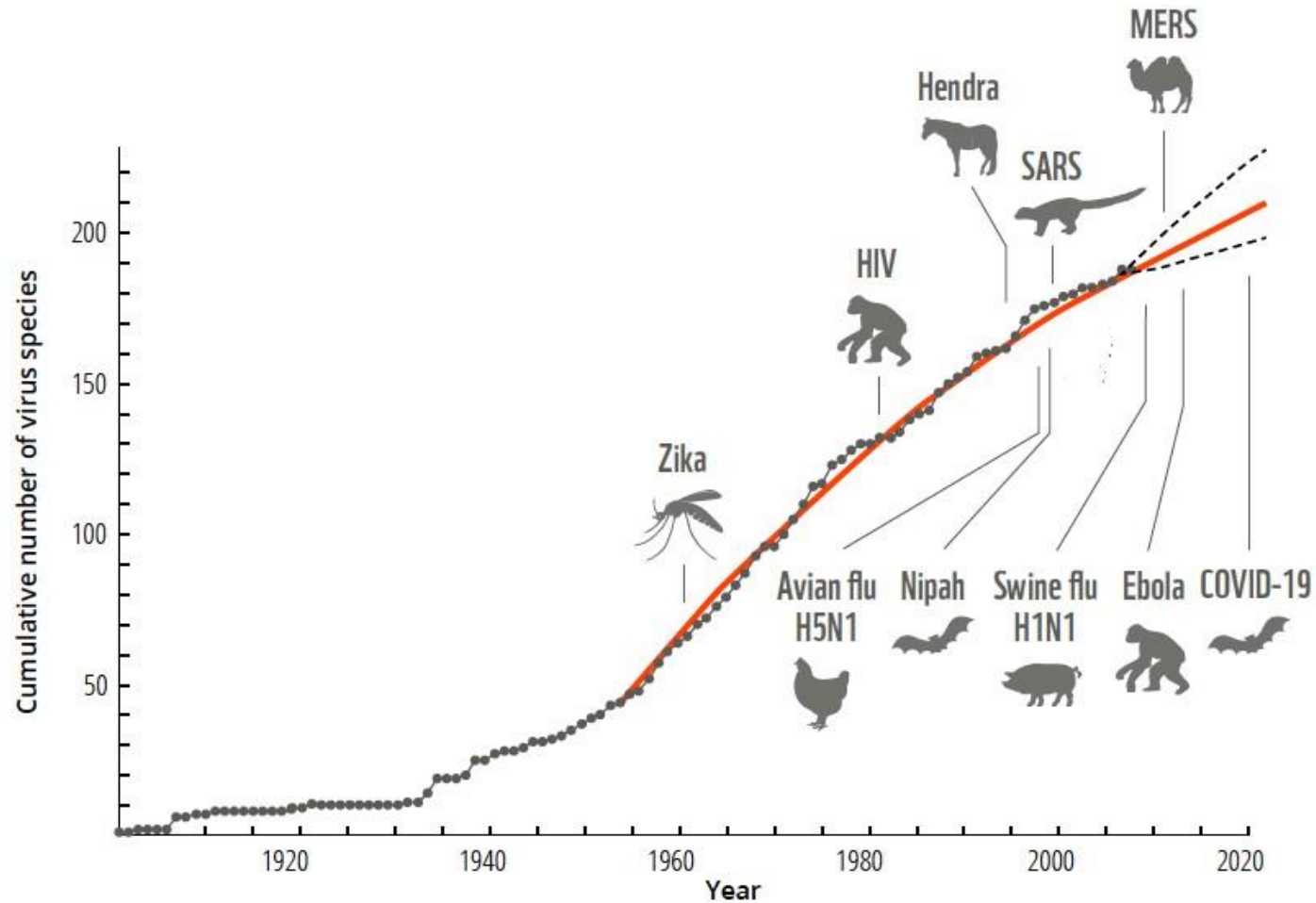
Trend of Mass extinction continues



The population sizes of mammals, birds, fish, amphibians and reptiles have seen an alarming average drop of **68%** since 1970

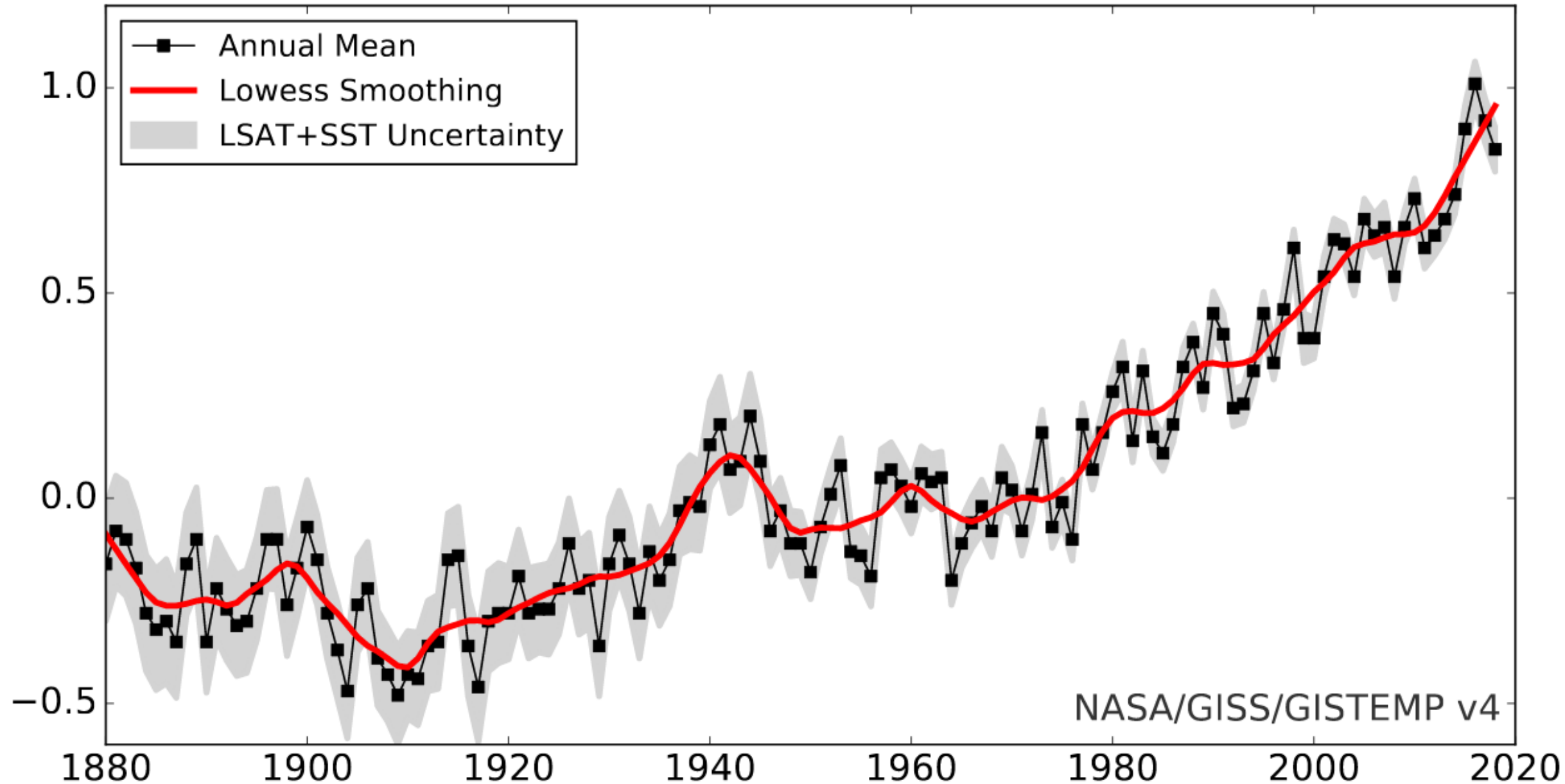


Zoonotic Virus diseases on the rise



Global Mean Estimates based on Land and Ocean Data

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

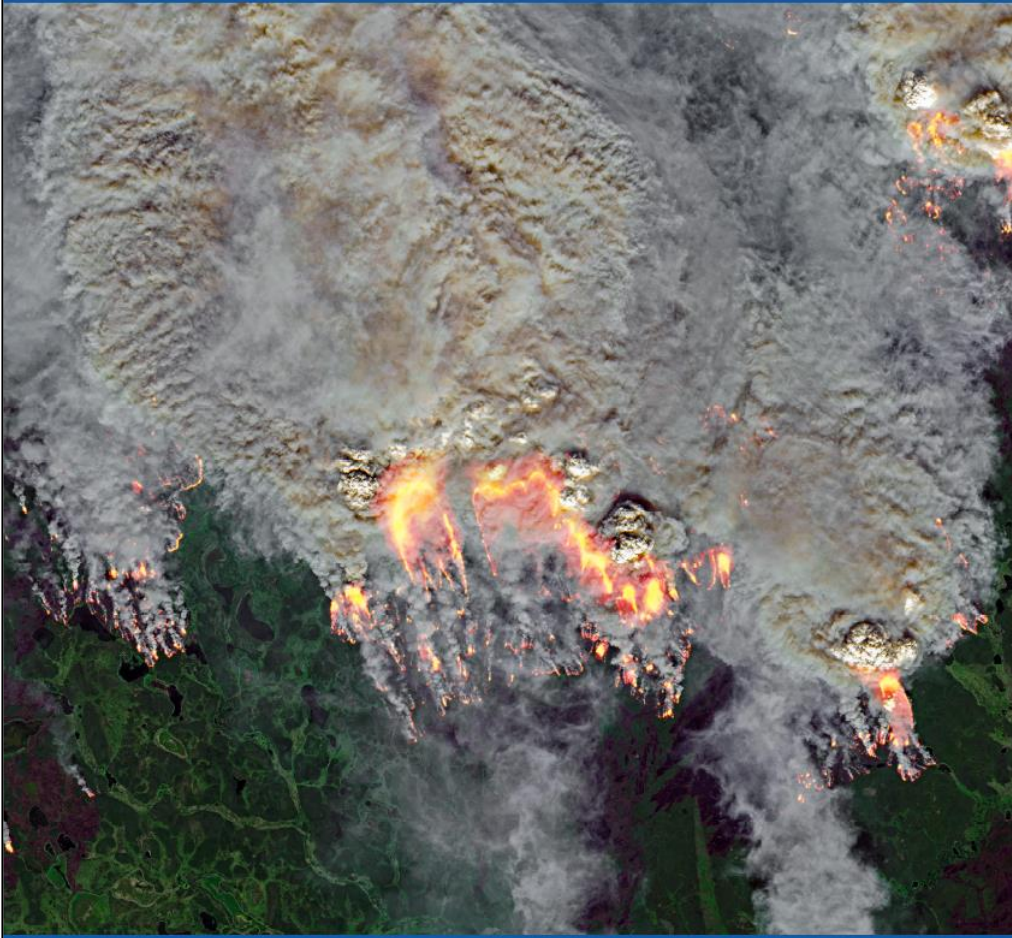


NASA/GISS/GISTEMP v4

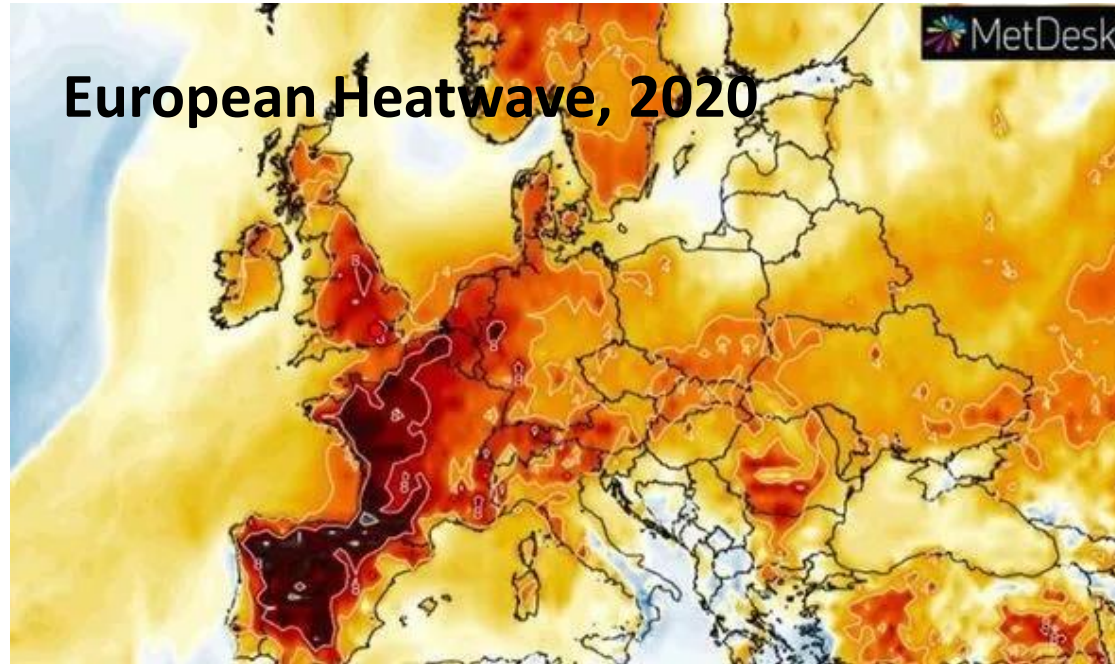


United in Science 2020

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

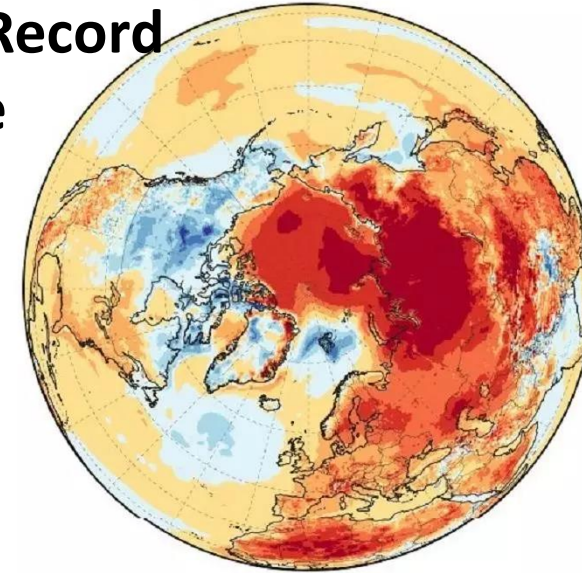


Unsafe territory: Extreme events in 2020



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

Siberia's Record Heatwave



Climate Change Impacts Already Pose Risks to Peace and Security

The New York Times

Researchers Link Syrian Conflict to a Drought Made Worse by Climate Change



<https://www.nytimes.com/2015/03/03/science/earth/study-links-syria-conflict-to-drought-caused-by-climate-change.html>

<https://www.theguardian.com/world/2018/oct/21/climate-change-is-exacerbating-world-conflicts-says-red-cross-president>

Climate change is exacerbating world conflicts, says Red Cross president

'It's obvious some of the violence we are observing ... is directly linked to climate change,' says Peter Maurer



Sahel food crisis has been made worse by the widespread unrest in Africa

Gaddafi-armed Tuareg rebels in Mali and terrorist attacks in Nigeria are adding to the growing crisis in the Sahel



<https://www.theguardian.com/global-development/2012/mar/29/sahel-food-crisis-made-worse>

<https://www.bbc.com/news/world-asia-51179931>

People urgently fleeing climate crisis cannot be sent home, UN rules

20 January 2020

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Climate change



Fighting for Survival on Lake Chad

A Conflict Fueled By Global Warming

The region between Chad, Niger, Nigeria and Cameroon is dominated by violence, poverty and hunger and it is home to one of the most complex humanitarian crises in the world. Now, climate change is intensifying the problem.

<https://www.spiegel.de/international/world/a-war-fueled-by-global-warming-a-6b6965d4-f122-45f8-a146-d7a5f222a1dd>

World Scientists' Warning

WILLIAM J. RIPPLE, CHRISTOPHER WOLF, THOMAS...
AND 11,258 SCIENTIST SIGNATORIES FROM 155

Climate crisis: 11,000 scientists 'untold suffering'

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

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

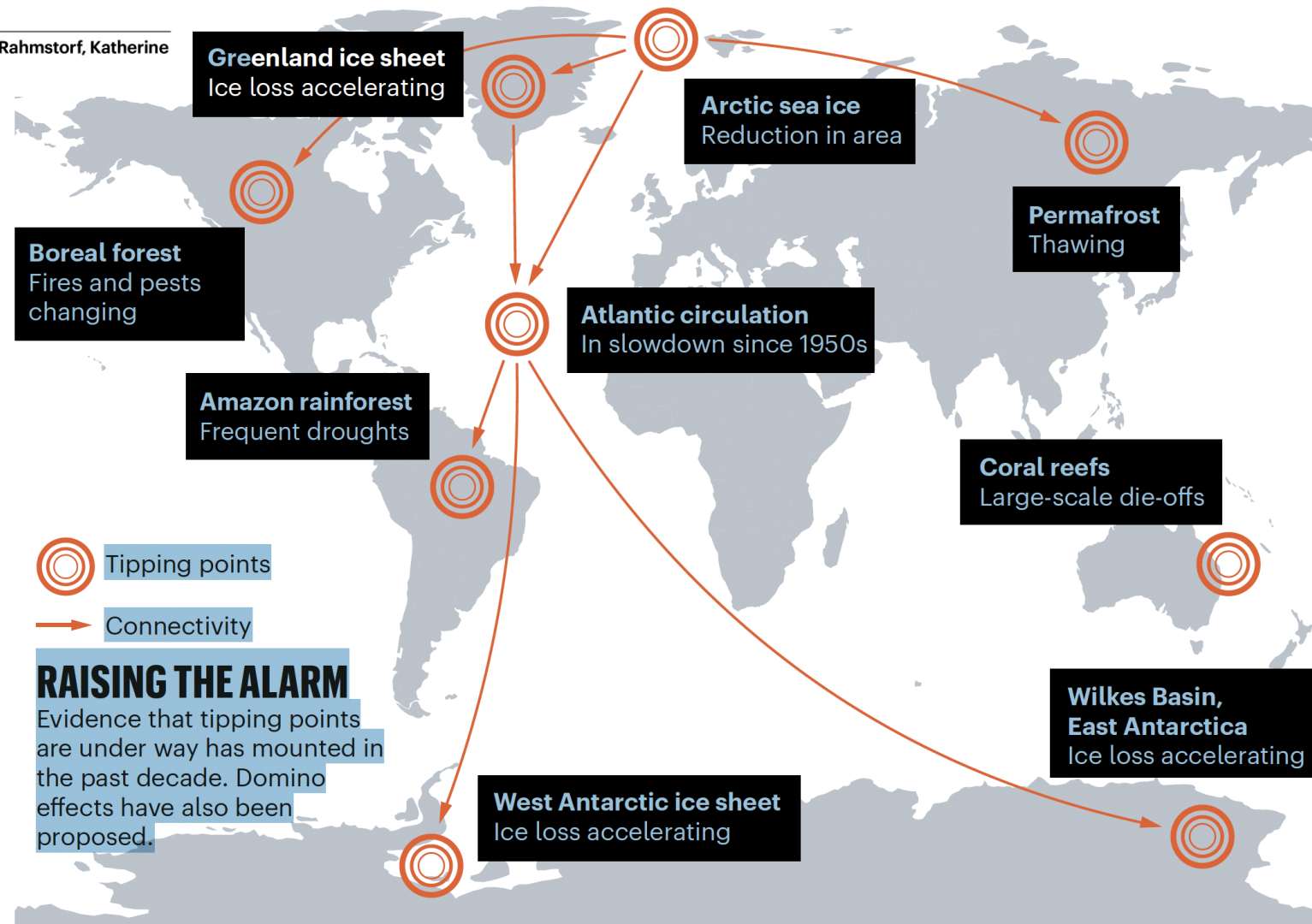


in 1,180 jurisdictions and local
citizens



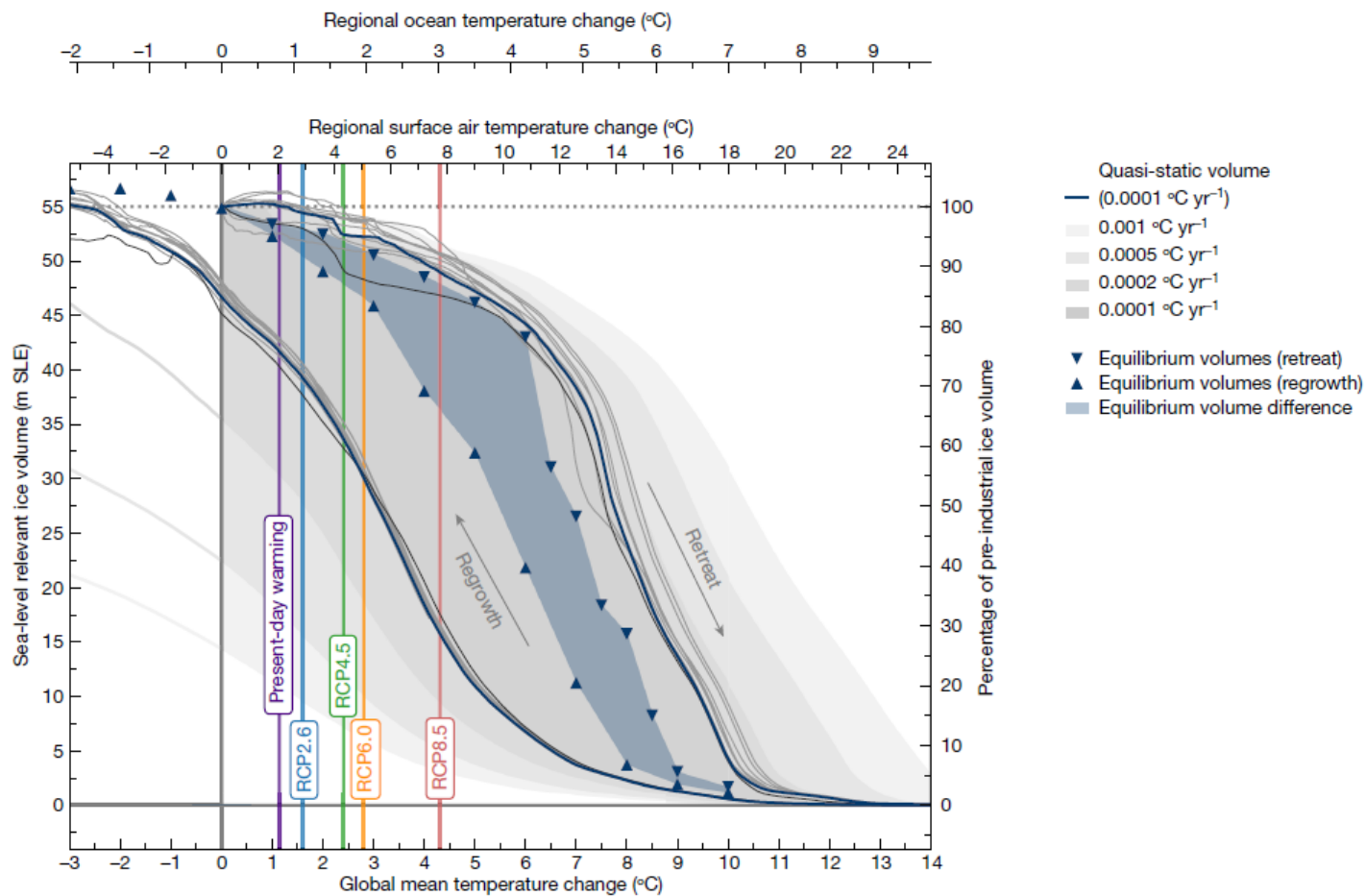
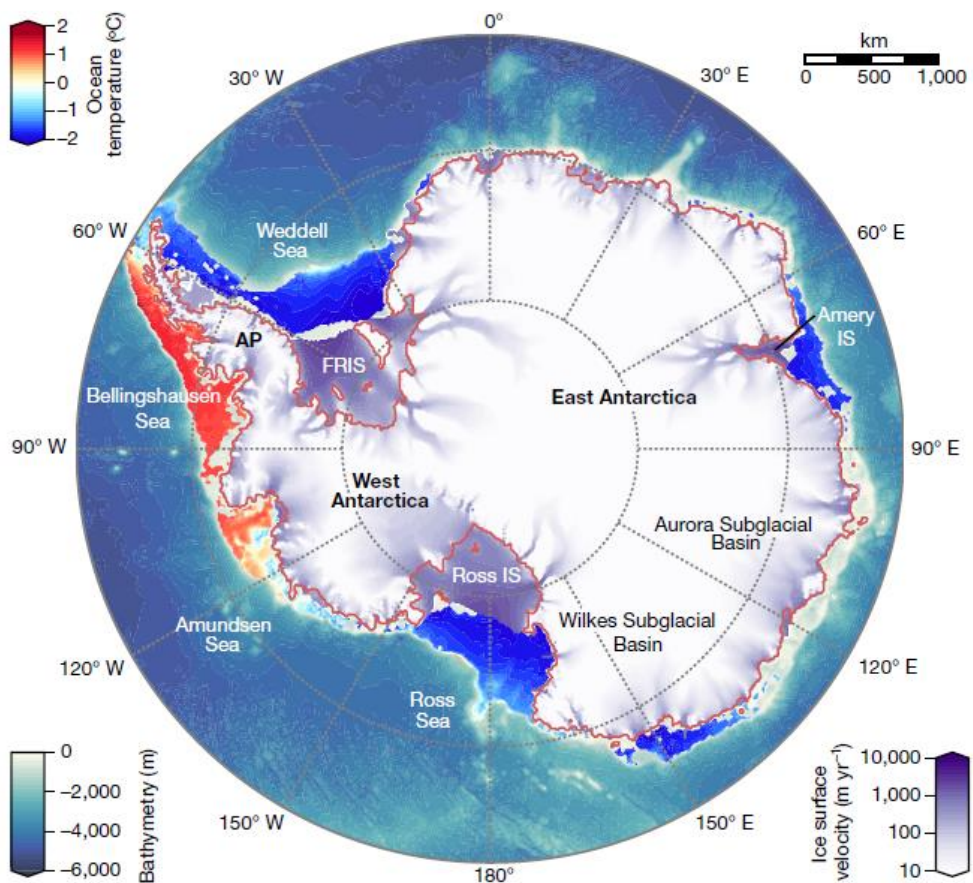
Climate tipping points – too risky to bet against

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



Stability Check on Antarctica Reveals High Risk for Long-Term Sea-Level Rise

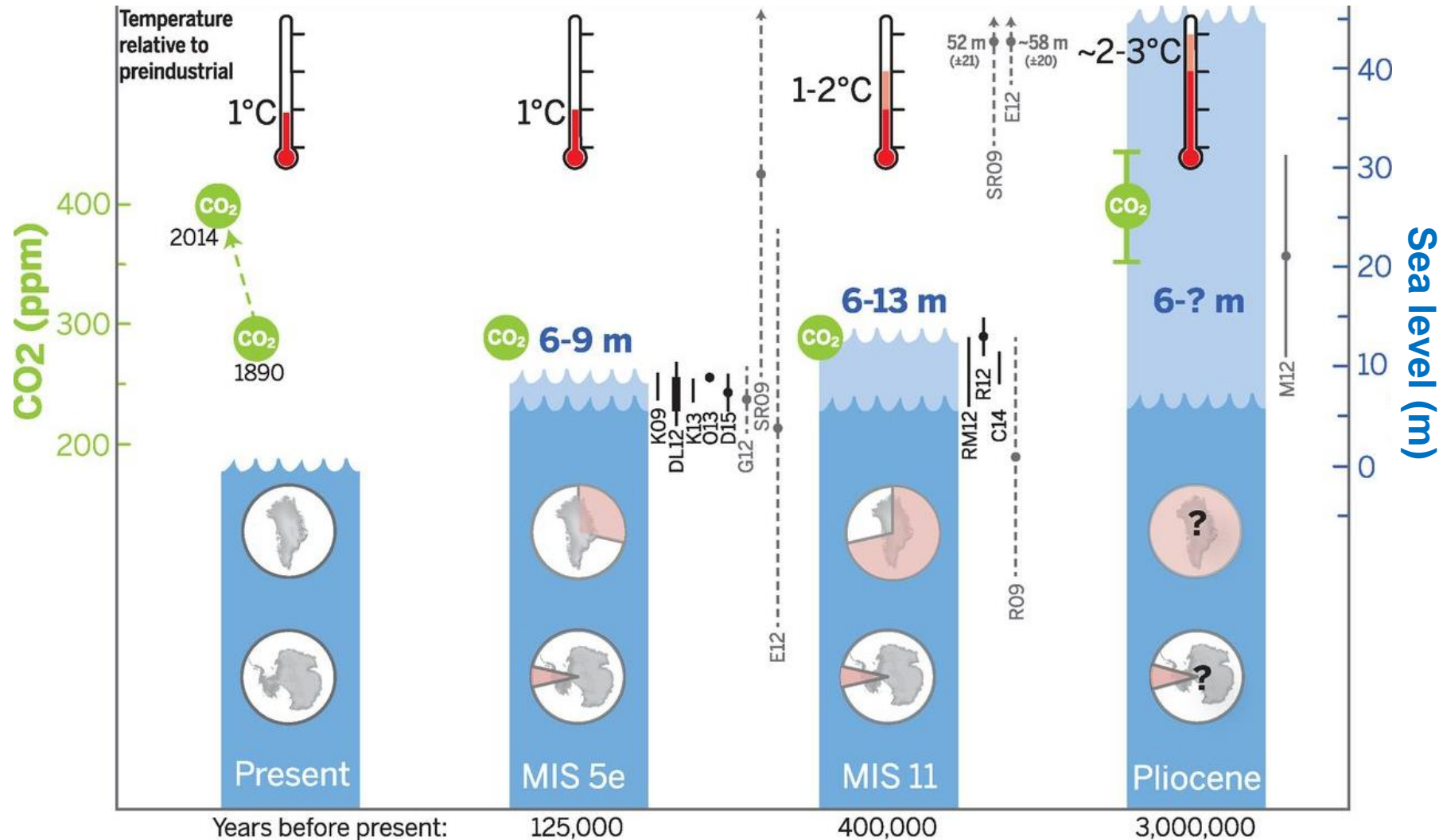
If the global mean temperature level is sustained long enough at 4 degrees above pre-industrial levels, Antarctic melting alone could eventually raise global sea levels by more than six meters.



Antarctic ice velocities and surrounding ocean temperatures

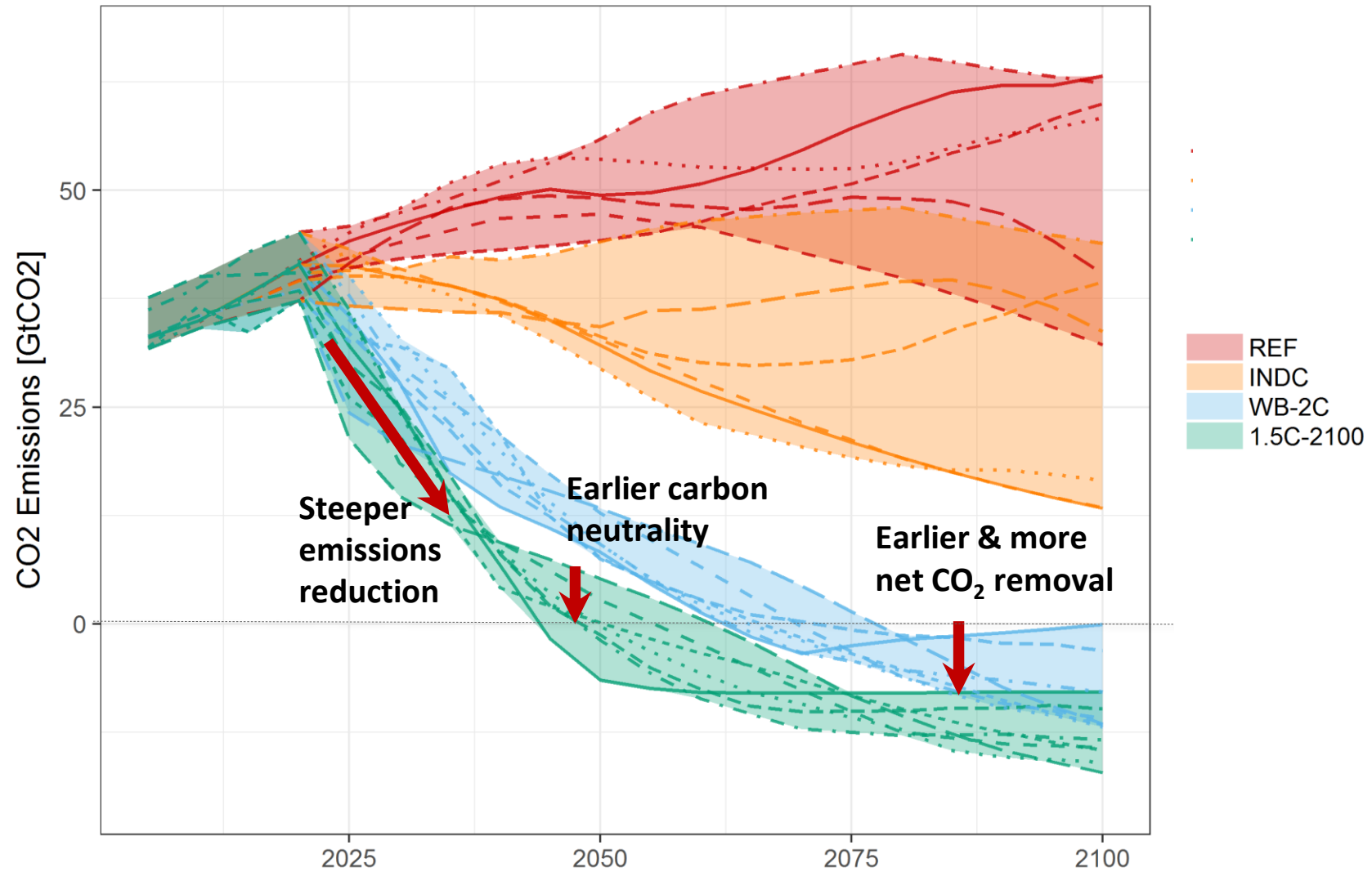
Hysteresis of the Antarctic Ice Sheet

Sea Level during Past Warm Periods



Peak global mean temperature, atmospheric CO₂, maximum GMSL, and source(s) of meltwater

The Additional Challenge of Limiting Warming to 1.5°C



30 SOLUTIONS FOR 2030

EXPONENTIAL CLIMATE ACTION ROADMAP

EXPONENTIAL ROADMAP

SCALING 36 SOLUTIONS TO
HALVE EMISSIONS BY 2030
VERSION 1.5, 2019

2030

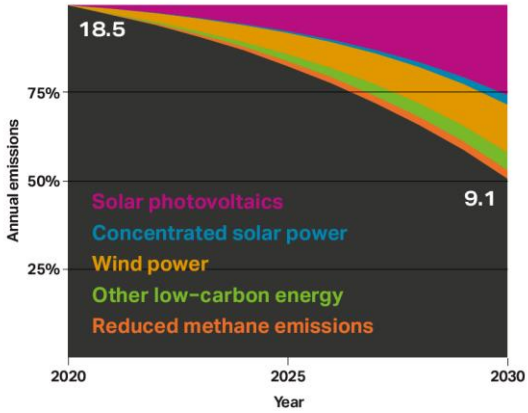
EXPONENTIAL ROADMAP

SCALING 36 SOLUTIONS TO
HALVE EMISSIONS BY 2030

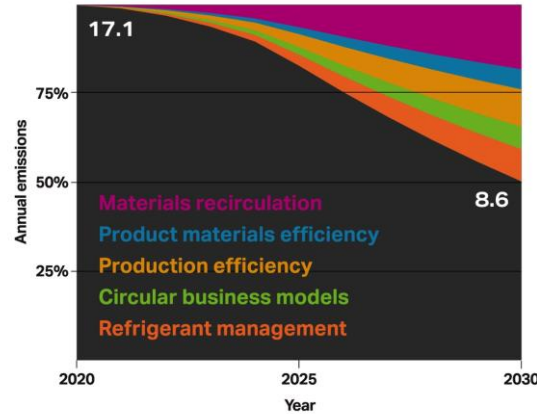
2030

Cutting Emissions by Half 2030

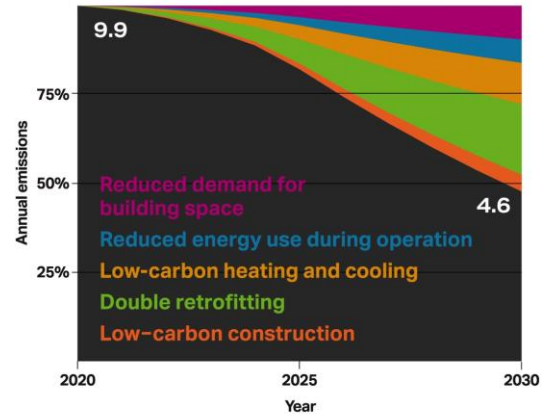
ENERGY SUPPLY



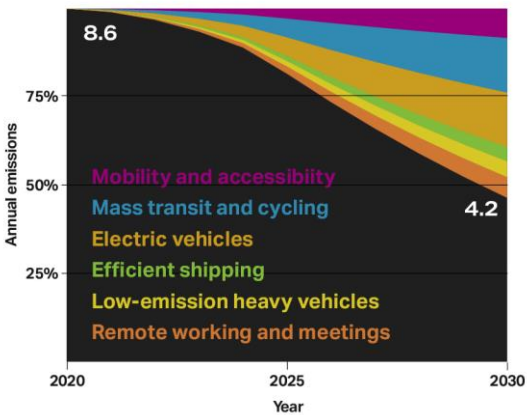
INDUSTRY



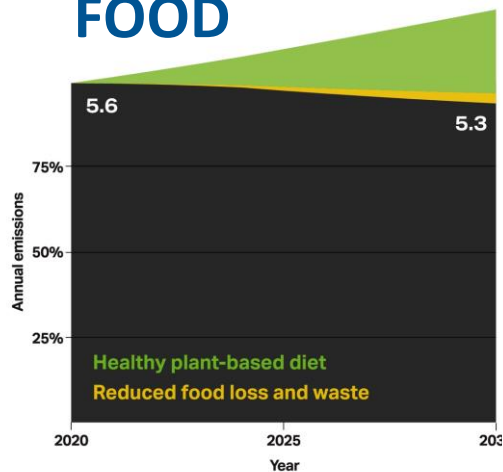
BUILDINGS



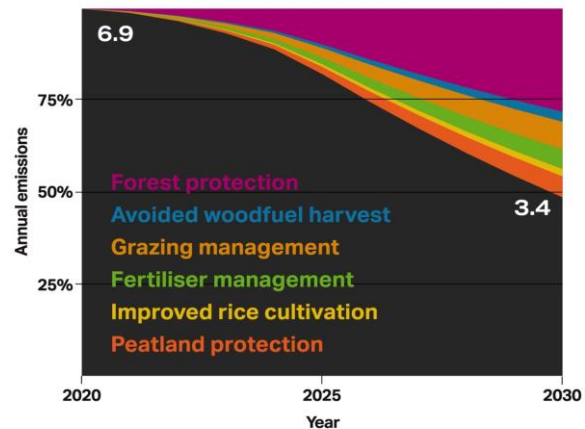
TRANSPORT



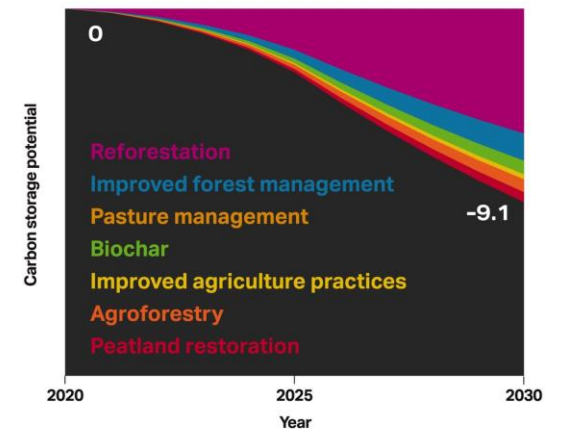
FOOD



NATURE SOURCES



NATURE SINKS



COUNTDOWN

To a healthier future

RACE TO ZERO

1,101 Businesses

452 Cities

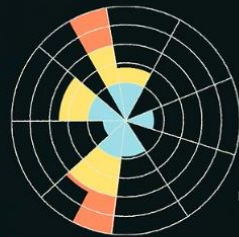
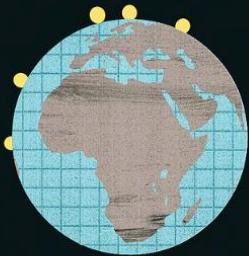
45 Investors

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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