

The imperative for climate action to protect health

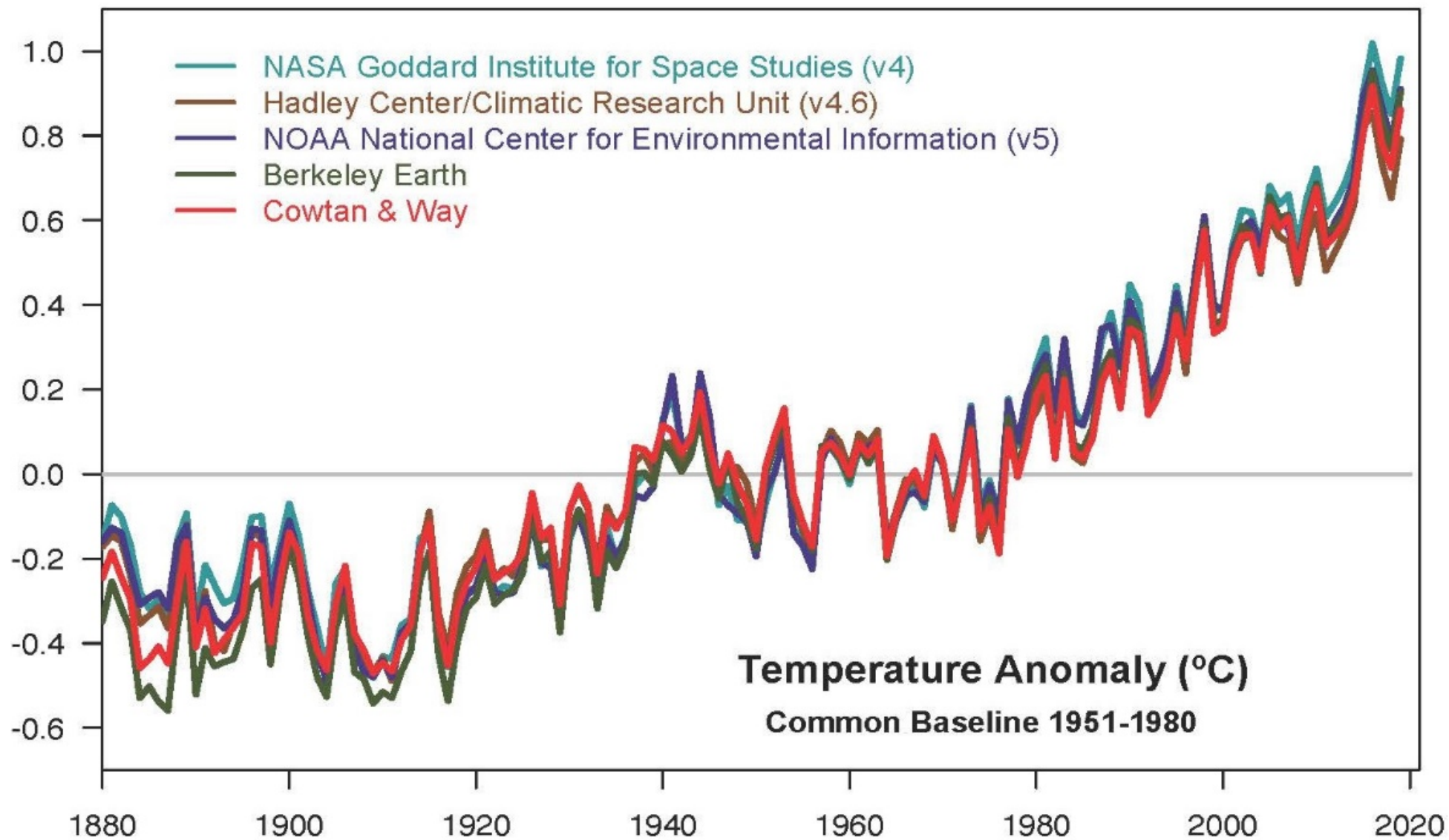


Centre on
Climate Change &
Planetary Health

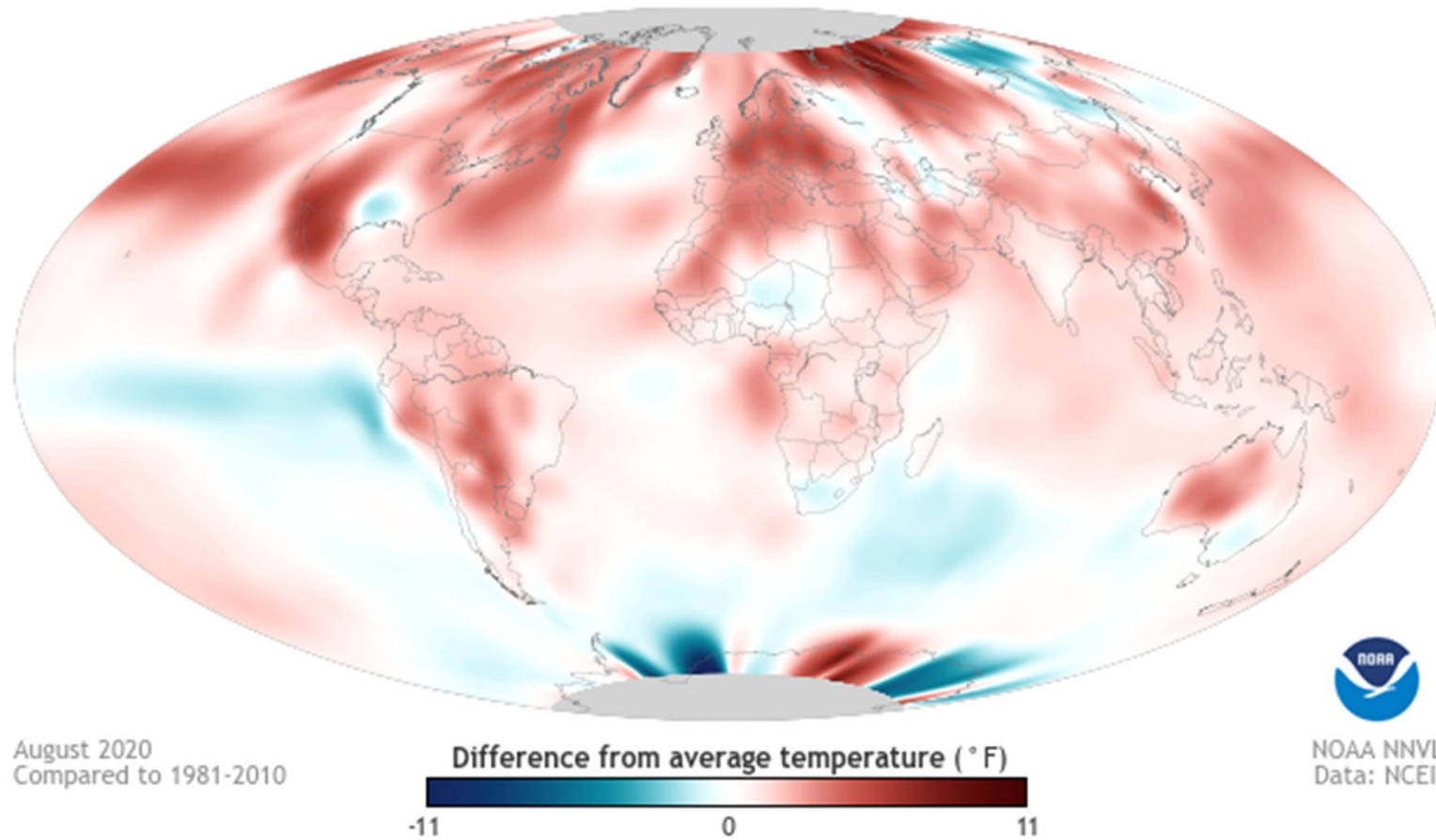
Andy Haines



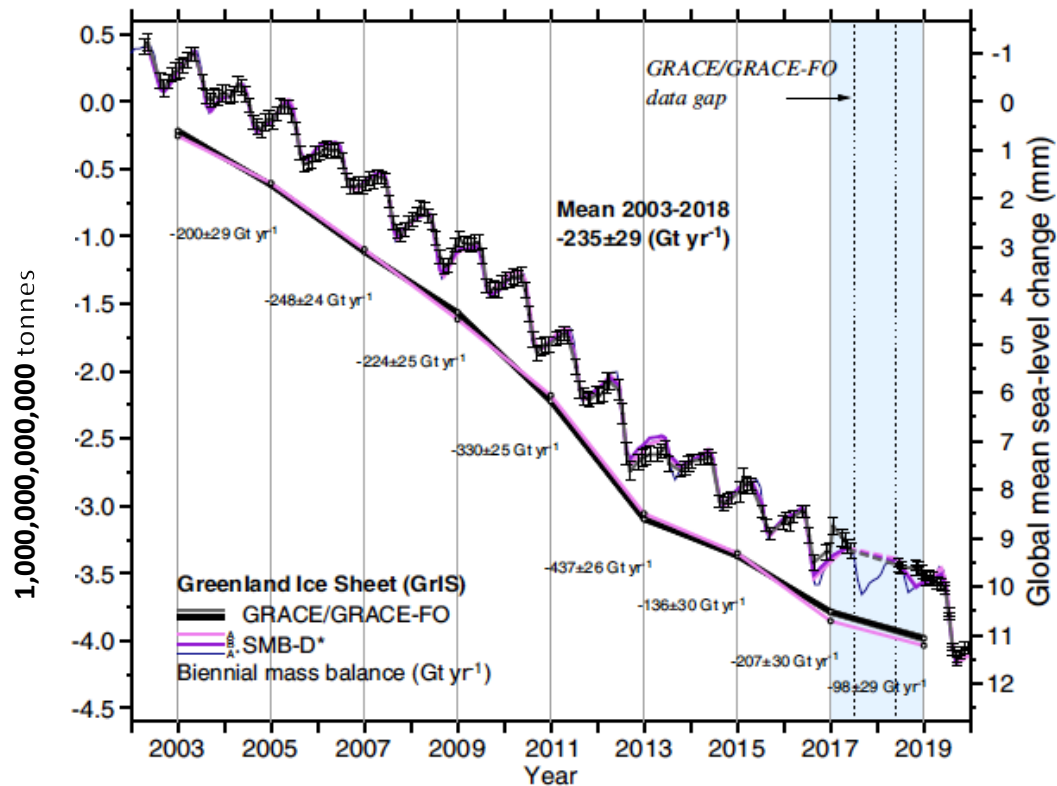
LONDON
SCHOOL of
HYGIENE
& TROPICAL
MEDICINE



Difference from 1981-2010 average temperature ° F --August 2020



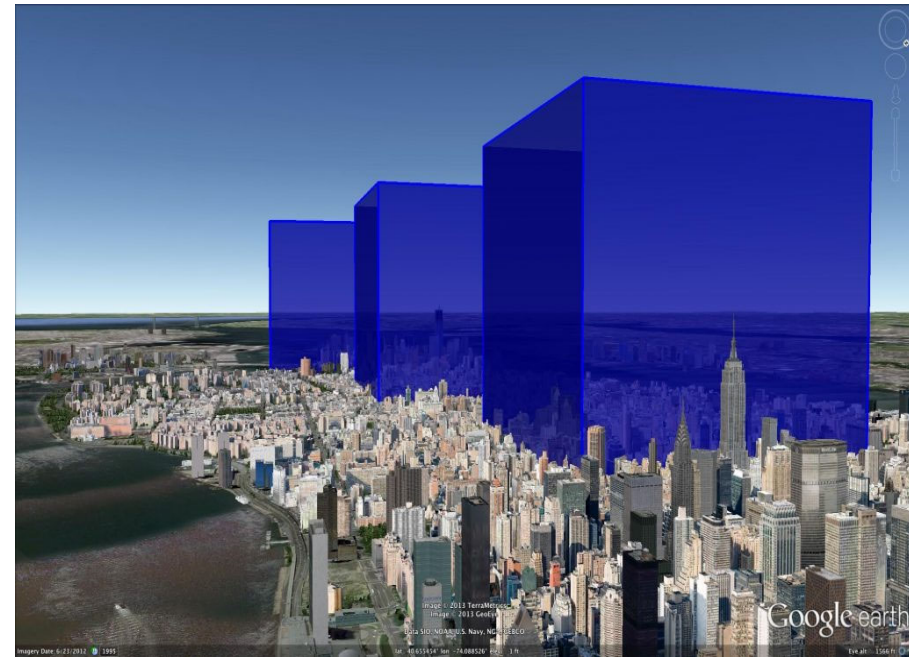
Greenland ice sheet record annual mass loss of 532 ± 58 Gt yr in 2019



COMMUNICATIONS EARTH & ENVIRONMENT | <https://doi.org/10.1038/s43247-020-0010-1>

Sasgen, I et al 2020

<https://www.nature.com/articles/s43247-020-0010-1>

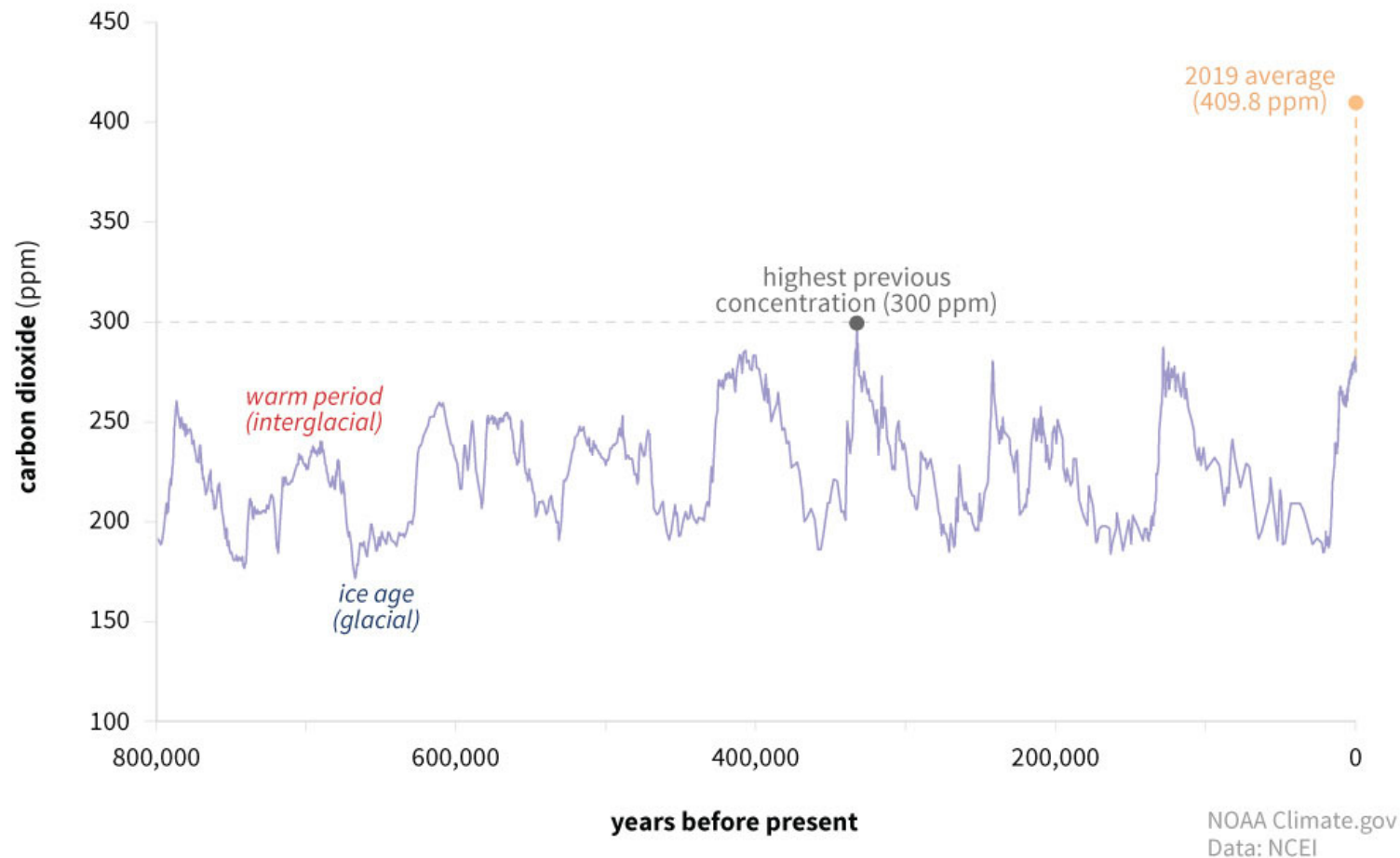


Envisioning 3 gigatonnes of water compared to Manhattan Skyline

















Source Alex Gardner

Carbon dioxide – a legacy for future generations, 15 to 40% of emitted CO₂ will remain in the atmosphere longer than 1,000 years.

CARBON DIOXIDE OVER 800,000 YEARS



Highly Potent Short-Lived Climate Pollutants—Sources and Impacts

POLLUTANT	SOURCES	MAJOR IMPACTS
BLACK CARBON	 black coal  diesel exhaust  biomass for cookstoves	 local regional
METHANE	 natural gas  livestock  landfills	 global
TROPOSPHERIC OZONE	 methane methane  carbon monoxide  nitrogen oxide  volatile organic compounds	 local regional
HYDROFLUORO-CARBONS	 air conditioning  refrigeration	 global

Source: The Climate and Clean Air Coalition.

Notes: Black carbon and tropospheric ozone also have a small global impact; methane also has small local and regional impacts.



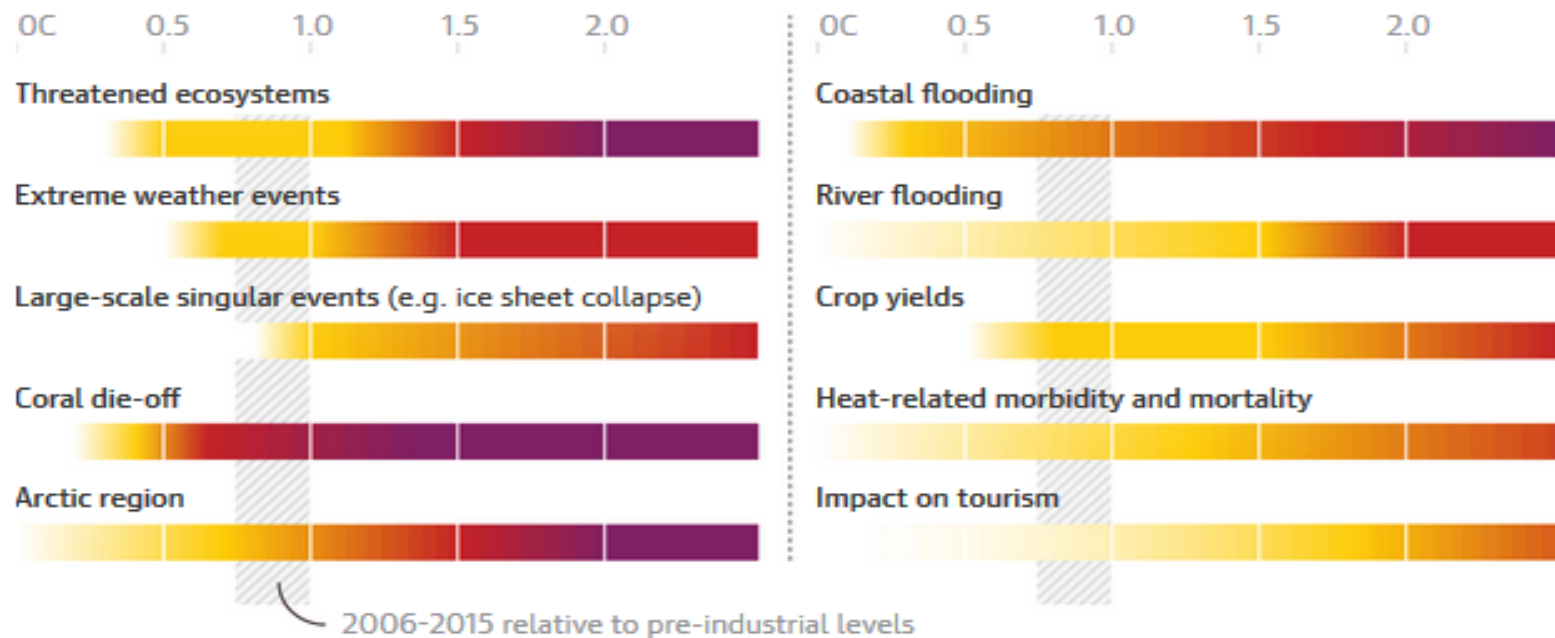
WORLD RESOURCES INSTITUTE

Rising temperatures, rising risks

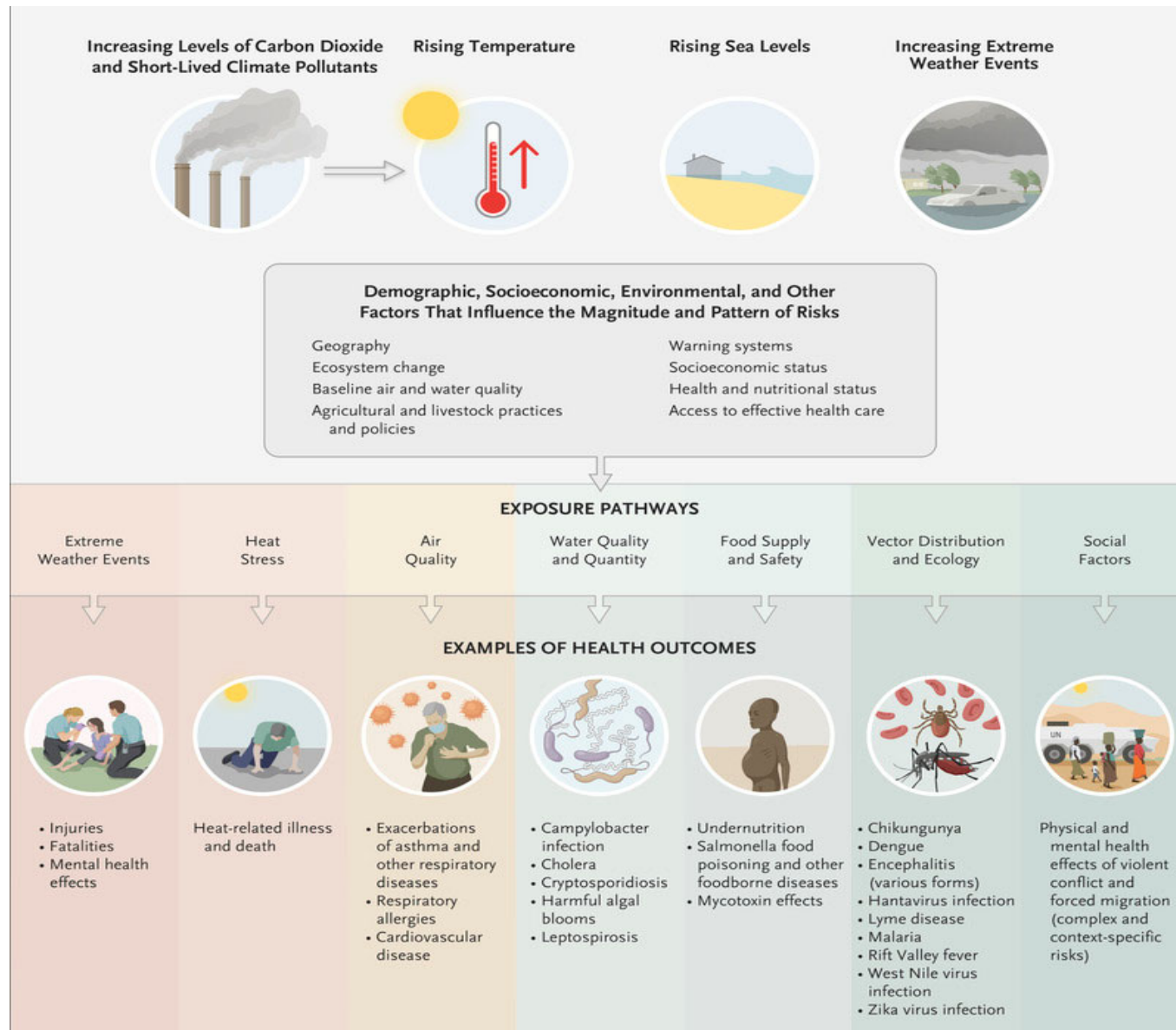
Key to impacts and risks



Global mean surface temperature change relative to pre-industrial levels, C



Guardian graphic. Source: IPCC Special Report on Global Warming of 1.5C

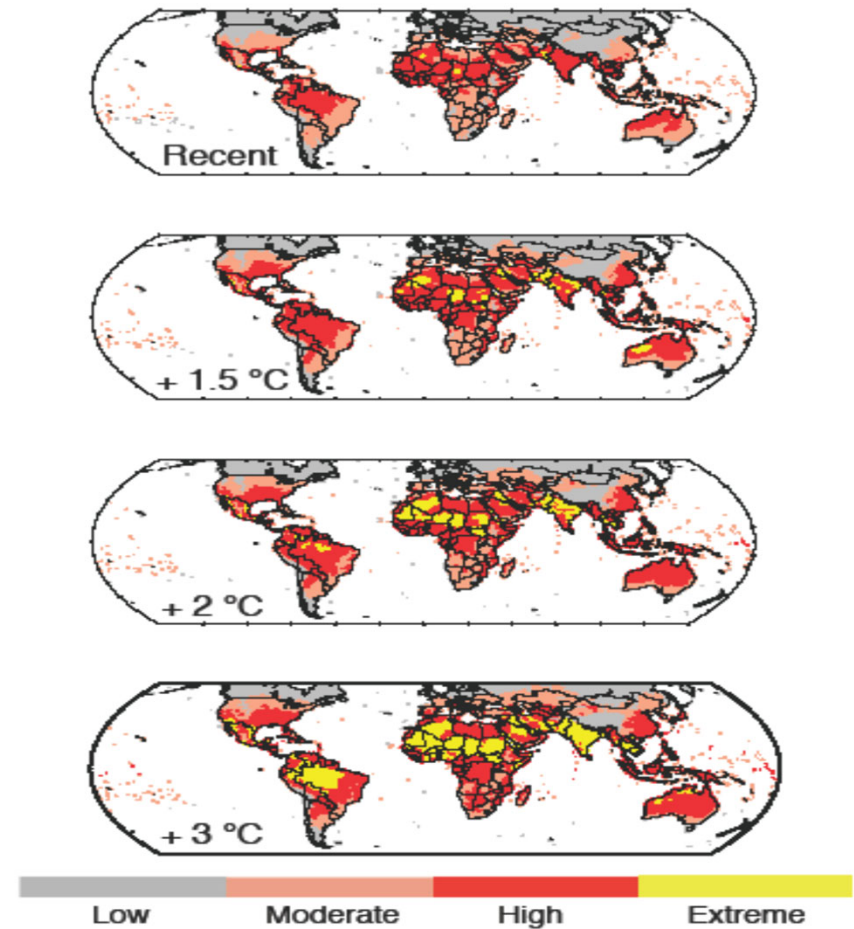


(Haines and Ebi
NEJM 2019)

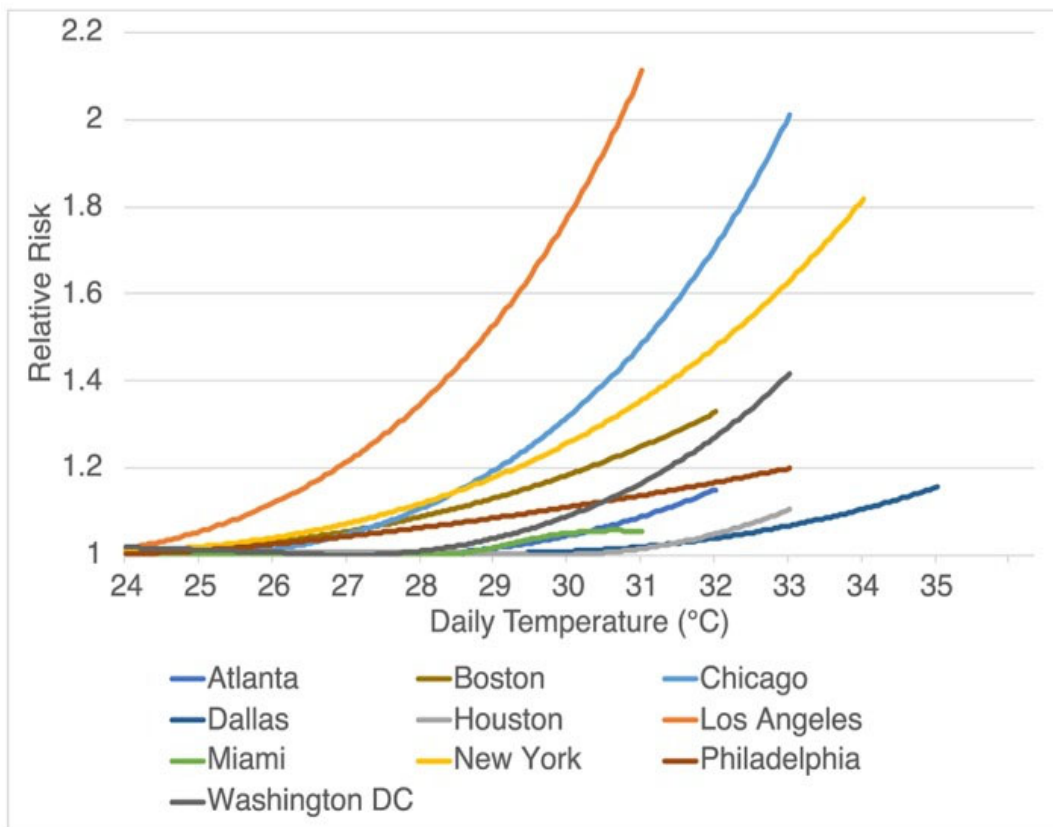
~1 billion people exposed to extreme heat preventing moderate physical labour in the hottest month after global temperature $>2.5^{\circ}\text{C}$ above pre-industrial levels.



(Andrews et al 2018 Lancet Planetary Health)

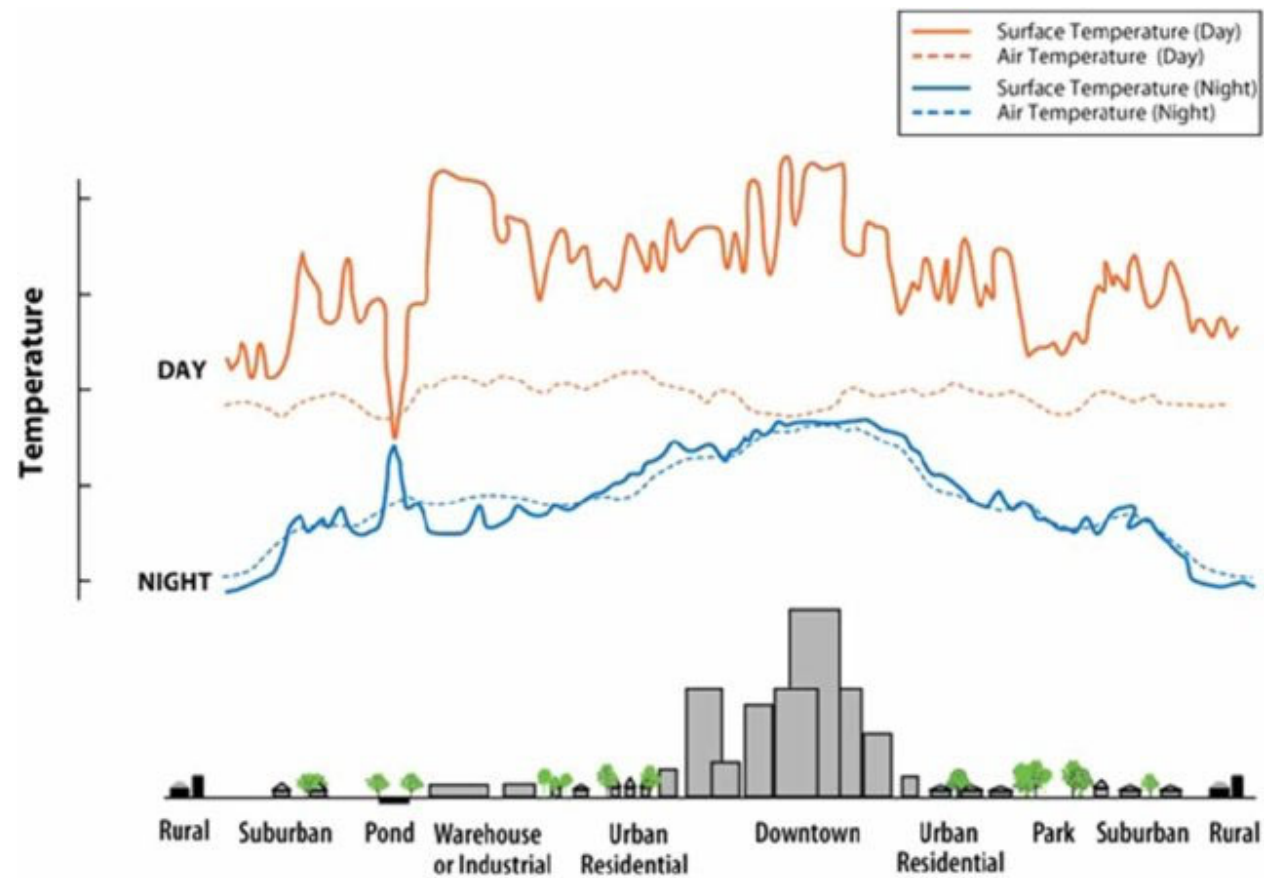


Major increases (~97,000 annually) by 2100 in US heat related deaths in a high emission future-- RCP 8.5-- even with adaptation
(Shindell et al Geohealth 2020)



Typical urban heat-island effects in a US city by day and night

(Source: NASA 2010, credit EPA).



Recent review of 116 papers confirmed increased wildfire risks from climate change.

<https://sciencebrief.org/topics/climate-change-science/wildfires>

Health effects --Xu et al NEJM 2020



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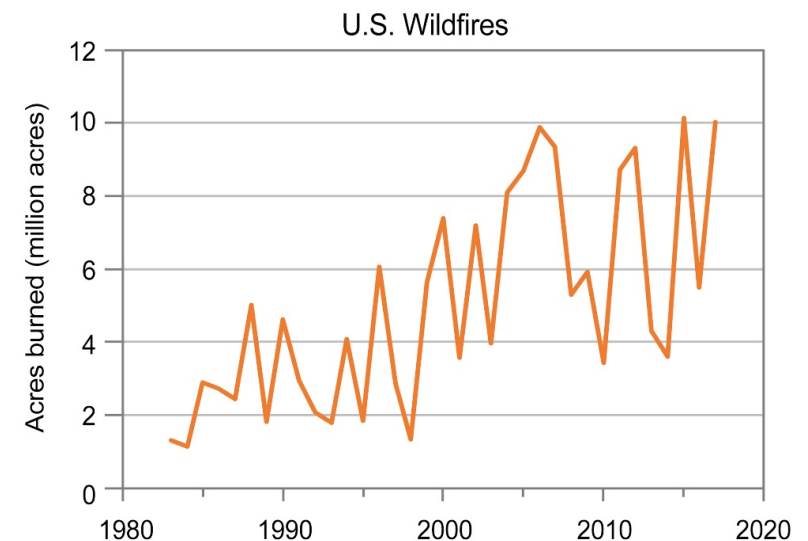
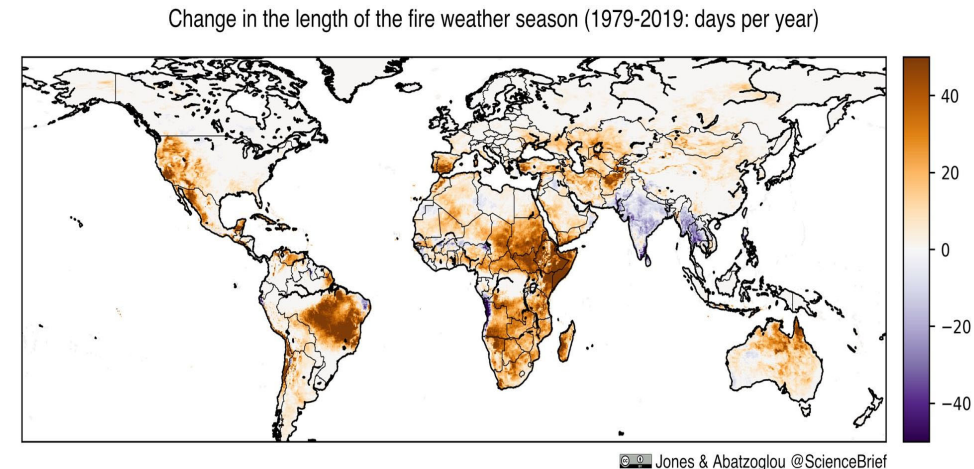
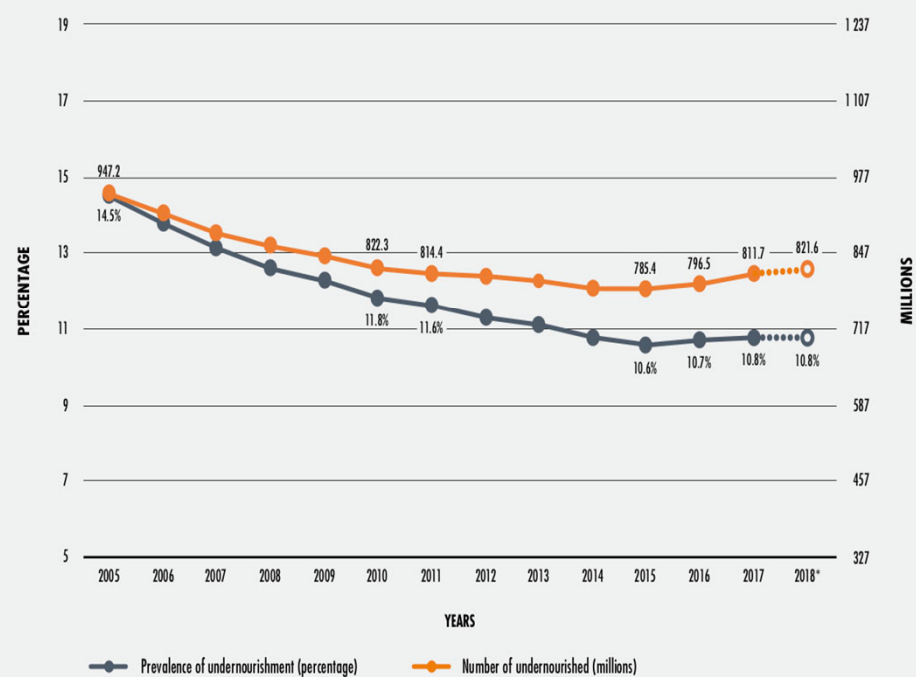


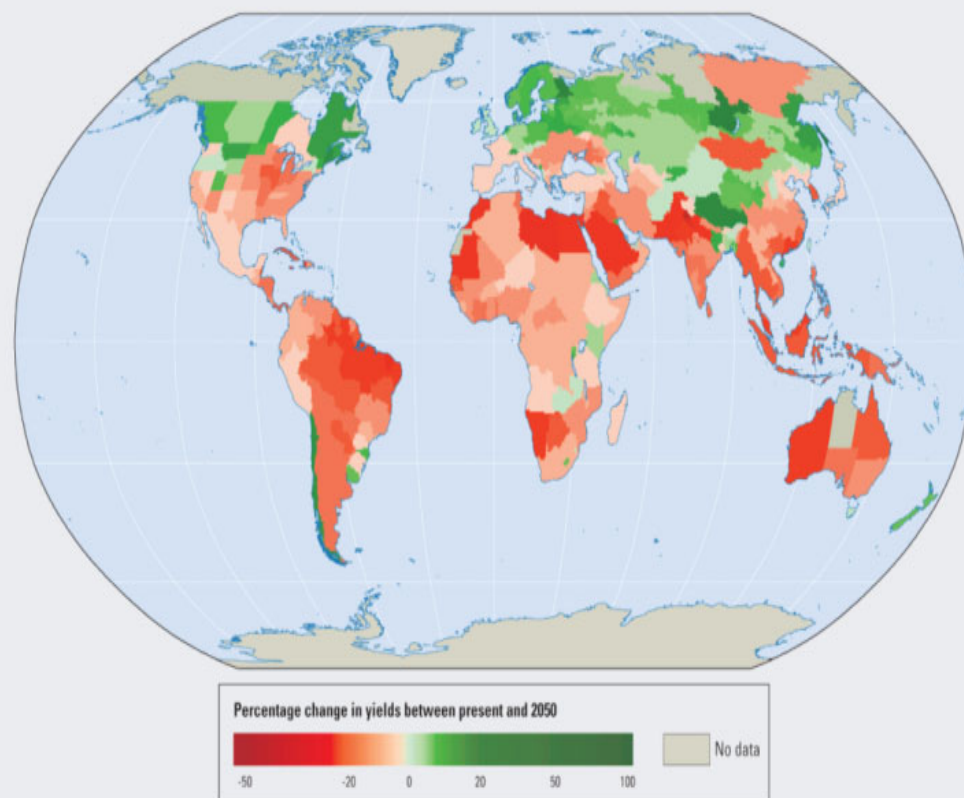
FIGURE 1
THE NUMBER OF UNDERNOURISHED PEOPLE IN THE WORLD HAS BEEN ON THE RISE SINCE 2015, AND IS BACK TO LEVELS SEEN IN 2010–2011



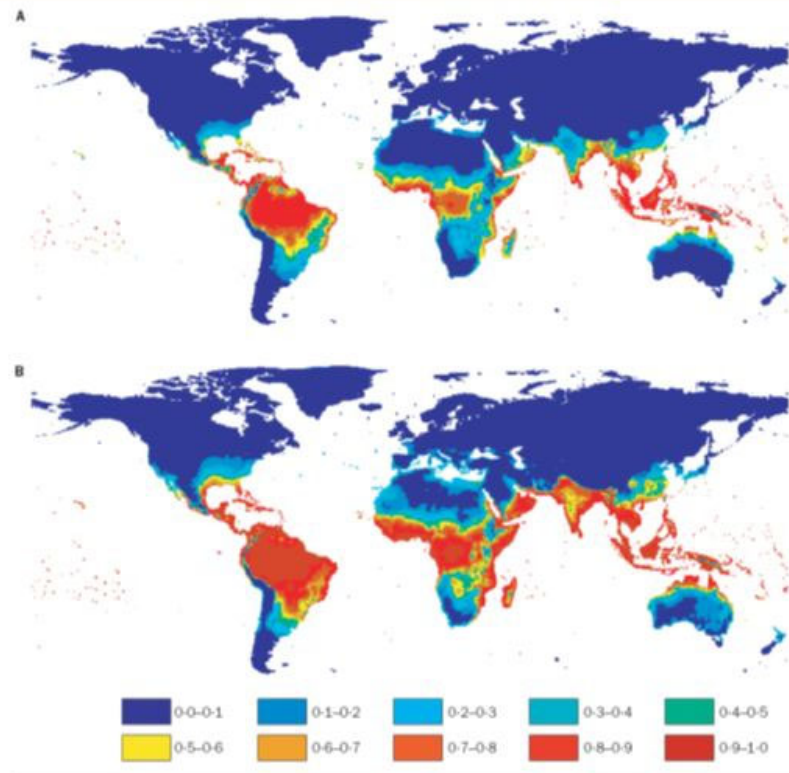
NOTES: * Values for 2018 are projections as illustrated by dotted lines and empty circles. The entire series was carefully revised to reflect new information made available since the publication of the last edition of the report; it replaces all series published previously. See Box 2.
SOURCE: FAO.

Impacts of climate change on the productivity of food crops in 2050

World Bank Publishers
World bank Development report 2010
<http://wdronline.worldbank.org/>



Future climate change and dengue



Climate change is expected to increase the proportion of the global population exposed to dengue from about 35% (upper figure), to 50-60% (lower figure), by 2085.

Hales et al, *Lancet* 2002



Photo by Jasper wilde on unsplash

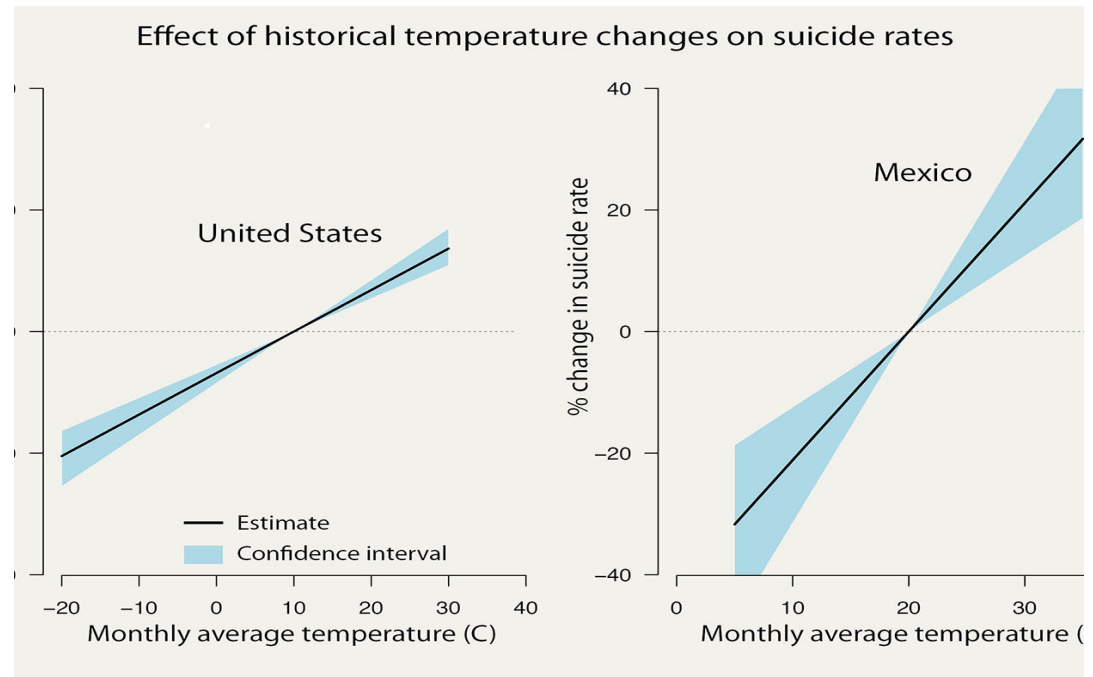
Many studies have shown increase in common mental disorders for considerable periods after floods



Photo by [billow926](#) on [Unsplash](#)

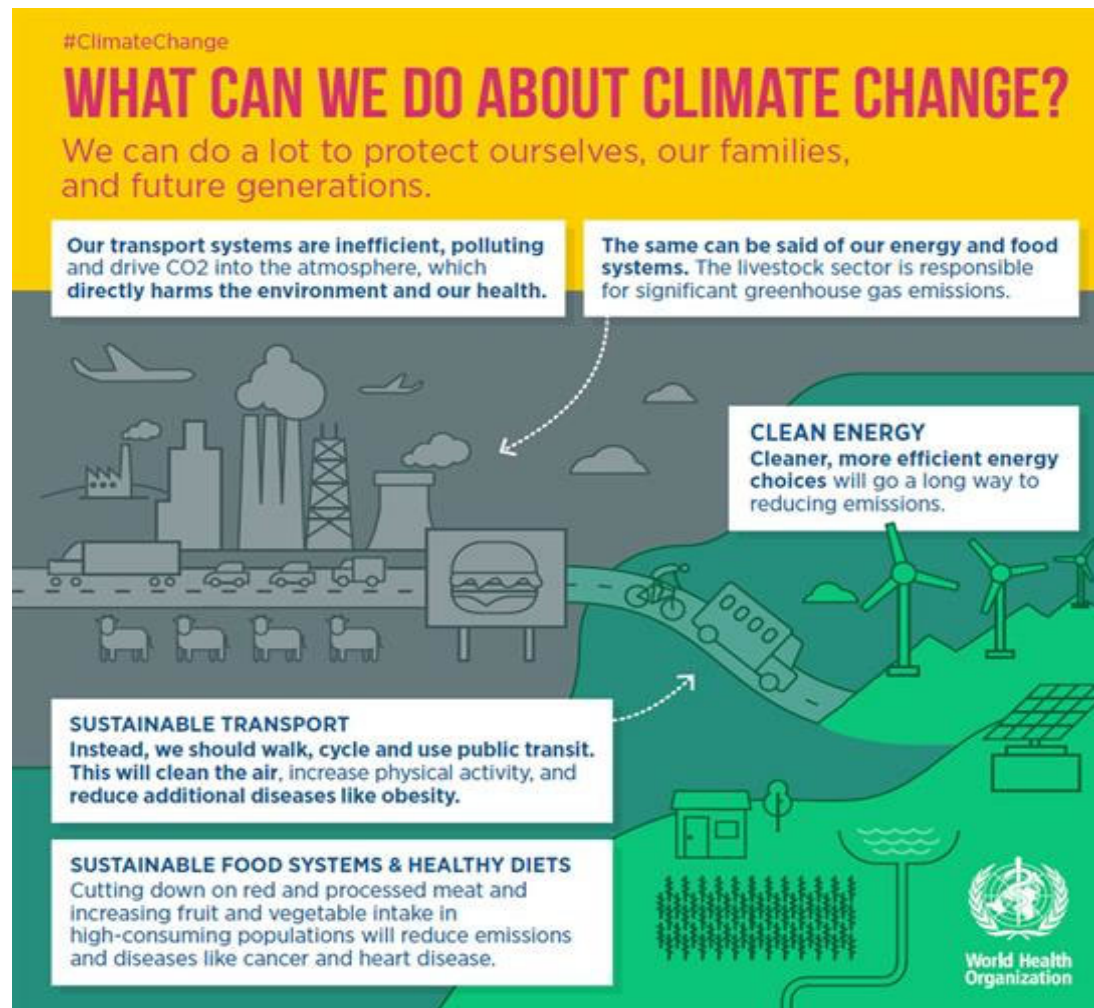
Mental health effects of environmental change (e.g. Ahern et al 2005)

Solastalgia is - “the distress caused by environmental change” • Albrecht et. al. (2007)

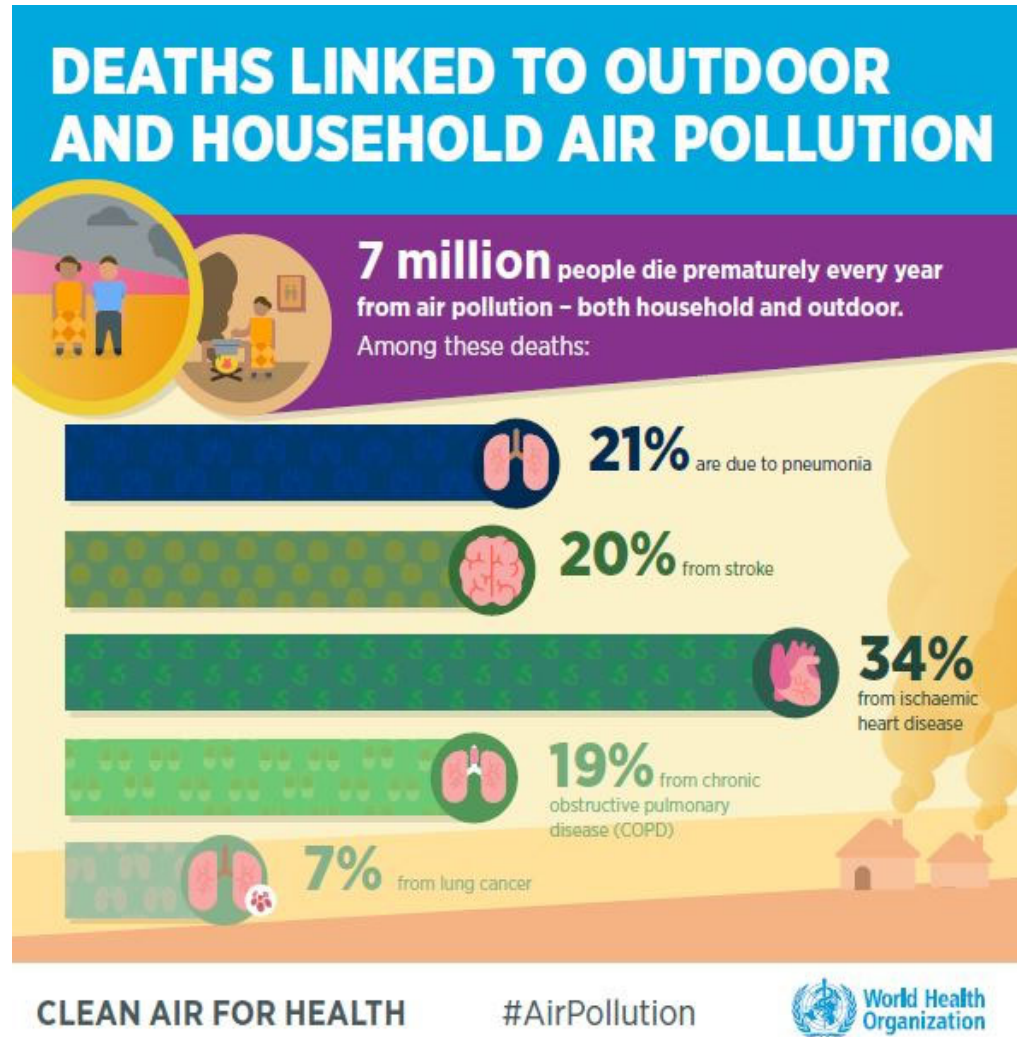


Source --Burke et al 2018, Nature Climate Change

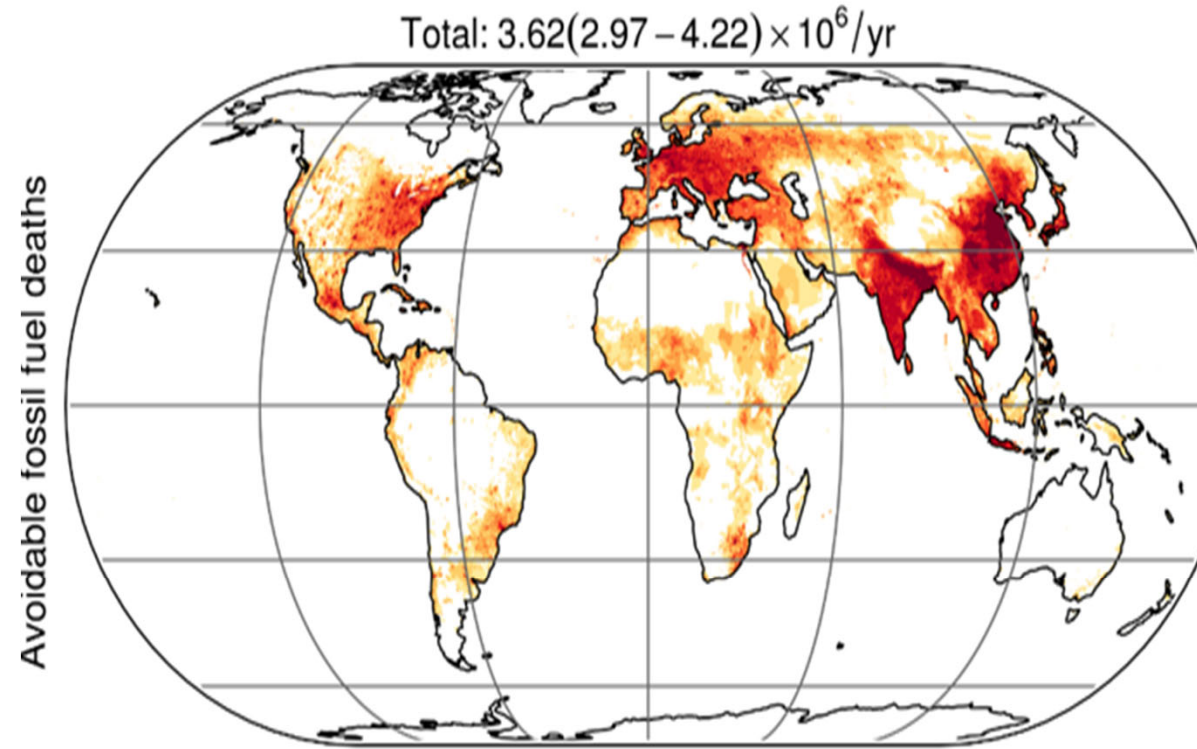
A healthy, climate-friendly, post-covid recovery



The benefits of clean air policies



Fossil fuel burning leads to ~3.6 million deaths annually from ambient air pollution (~190,000 in USA) (Lelieveld, Klingmüller Pozzer, Burnett, Haines, Ramanathan PNAS 2019)



Reforming taxes and subsidies for health, equity & climate.



Energy subsidies=the gap between existing and efficient prices (including health & environmental costs) ~US\$5.2 trillion in 2017; equivalent to 6.3% global GDP – local pollution a major component (IMF 2019).

Only ~ 22 % GHG emissions covered by carbon pricing (World Bank) which is often too low.


The EAT-Lancet Commission - planetary health diet and targets for sustainable food production that can prevent 10-11 million premature adult deaths per year and lead to a sustainable global food system by 2050.

THE LANCET

January, 2019

www.thelancet.com

Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems



"Food in the Anthropocene represents one of the greatest health and environmental challenges of the 21st century."

A Commission by The Lancet

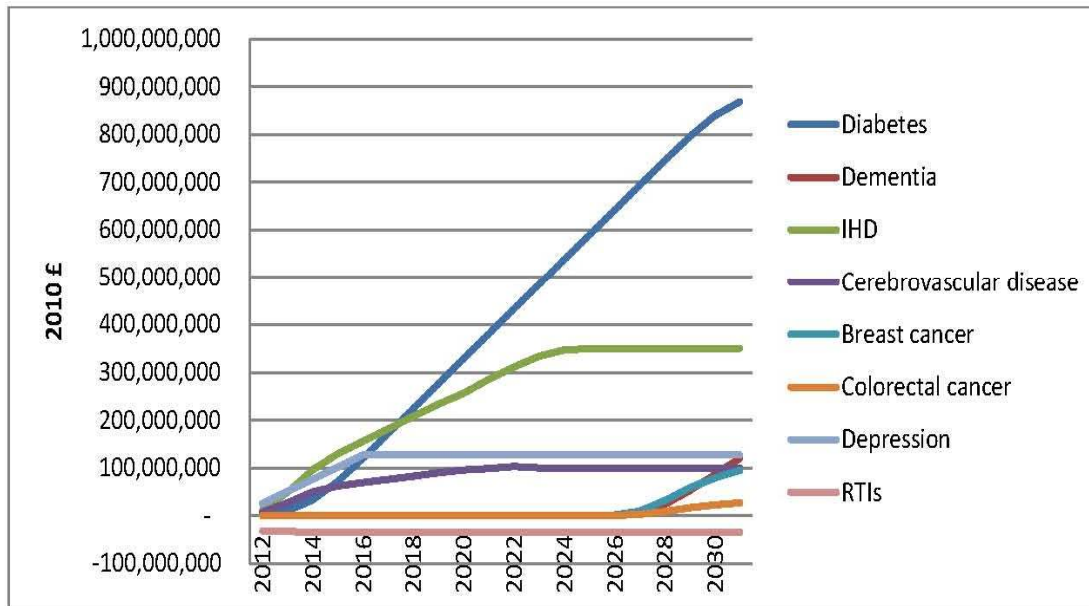
AND HERE'S WHAT WE SHOULD BE EATING EVERY DAY

Category	Food Item	Amount
FRUIT AND VEGETABLES	Fruits	200g
	Vegetables	300g
	Including dark green vegetables (cabbage, broccoli etc)	100g
	AND 100g red and orange vegetables (peppers, carrots)	100g
CARBOHYDRATE	Whole grains	232g
	Two slices of wholemeal toast	
	Rice 60g Pasta 80g	
DAIRY	Starchy vegetables (potatoes)	50g
	Dairy (half a pint of milk)	250g
ANIMAL-SOURCED PROTEIN	Fish (two thirds of a fish finger)	28g
	Pork (quarter of a rasher of bacon)	7g
PLANT-SOURCED PROTEIN	Eggs (fifth of an egg)	13g
	Beef or lamb (16th of a burger)	7g
	Soy foods 25g Nuts 50g	
SUGAR	Added sugar and artificial sweeteners	31g
	FAT	Olive oil, sunflower oil
FAT	Lentils or peas	50g
	Poultry (1.5 chicken nuggets)	29g

Increased active travel and low carbon transport – health and environmental benefits

(Woodcock et al 2009, Jarrett et al 2012))

Figure 1: Potential annual NHS expenditure averted by year and health outcome from Increased Active Travel scenario



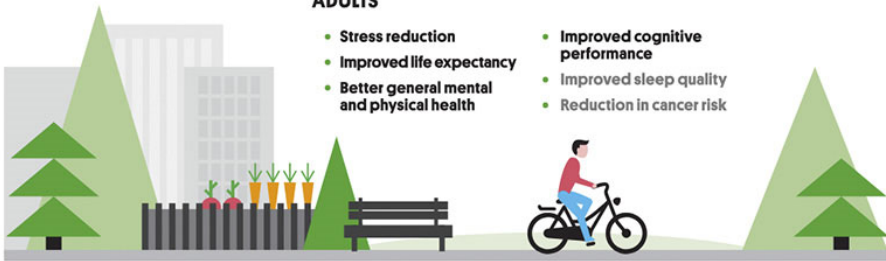
Increasing green space & reducing traffic in cities- the example of Superblocks in Barcelona (Mueller et al Env. Int. 2020)

The Health Benefits of Natural Spaces

ISGlobal

ADULTS

- Stress reduction
- Improved life expectancy
- Better general mental and physical health
- Improved cognitive performance
- Improved sleep quality
- Reduction in cancer risk



CHILDREN

Improvements in:

- Attention capacity
- Concentration
- Emotional and behavioural development
- Coordination
- Balance
- Agility
- Self-confidence
- Self-discipline
- Social skills
- Weight of newborns



• Further studies are needed to confirm these results

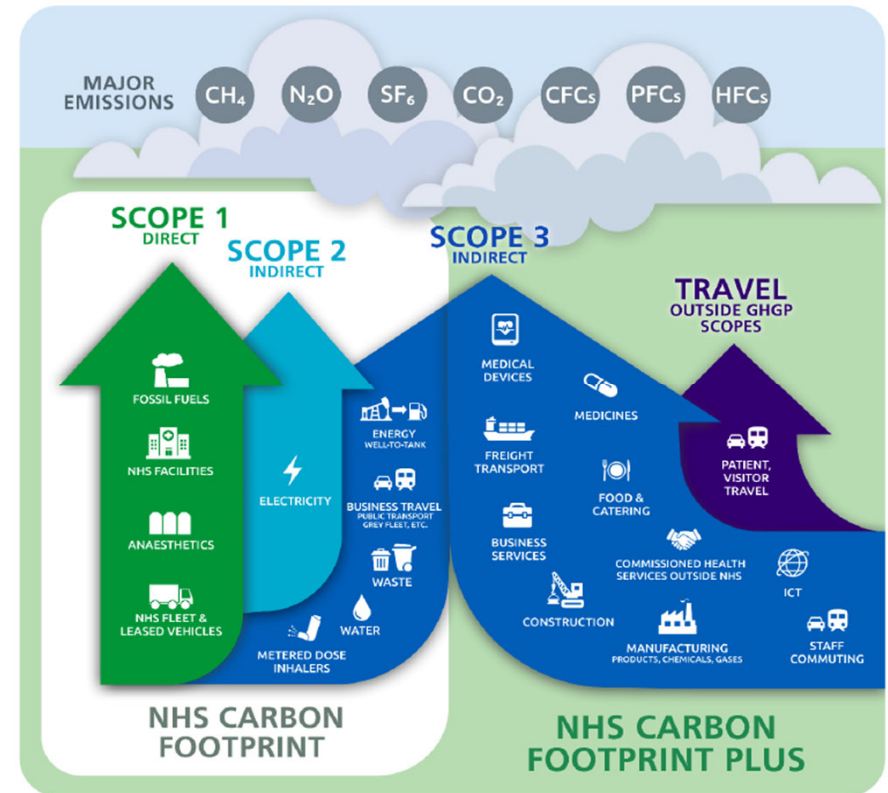


Reducing the carbon emissions from health care

--NHS England commits to net zero by 2040 for direct emissions and by 2045 for indirect emissions



Figure 1: GHGP scopes in the context of the NHS



Achieving a healthy, zero carbon economy



- These actors join 120 countries in the [largest ever alliance](https://unfccc.int/climate-action/race-to-zero-campaign) committed to achieving net zero carbon emissions by 2050 at the latest. <https://unfccc.int/climate-action/race-to-zero-campaign>