



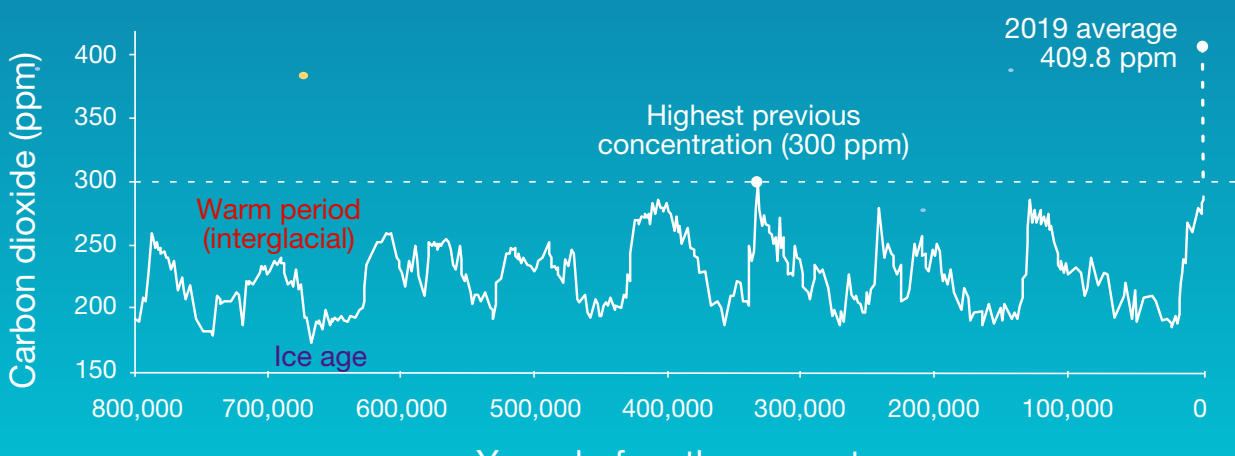
# SCIENCE OF CLIMATE CHANGE 2020

## PRESENT AND FUTURE

### Human influence on the climate system is clear

The concentration of CO<sub>2</sub> emissions in the atmosphere has increased beyond any level observed in the last 800,000 years.

CO<sub>2</sub> during glacial and warm periods in the last 800,000 years (its concentration has been reconstructed using ice cores)

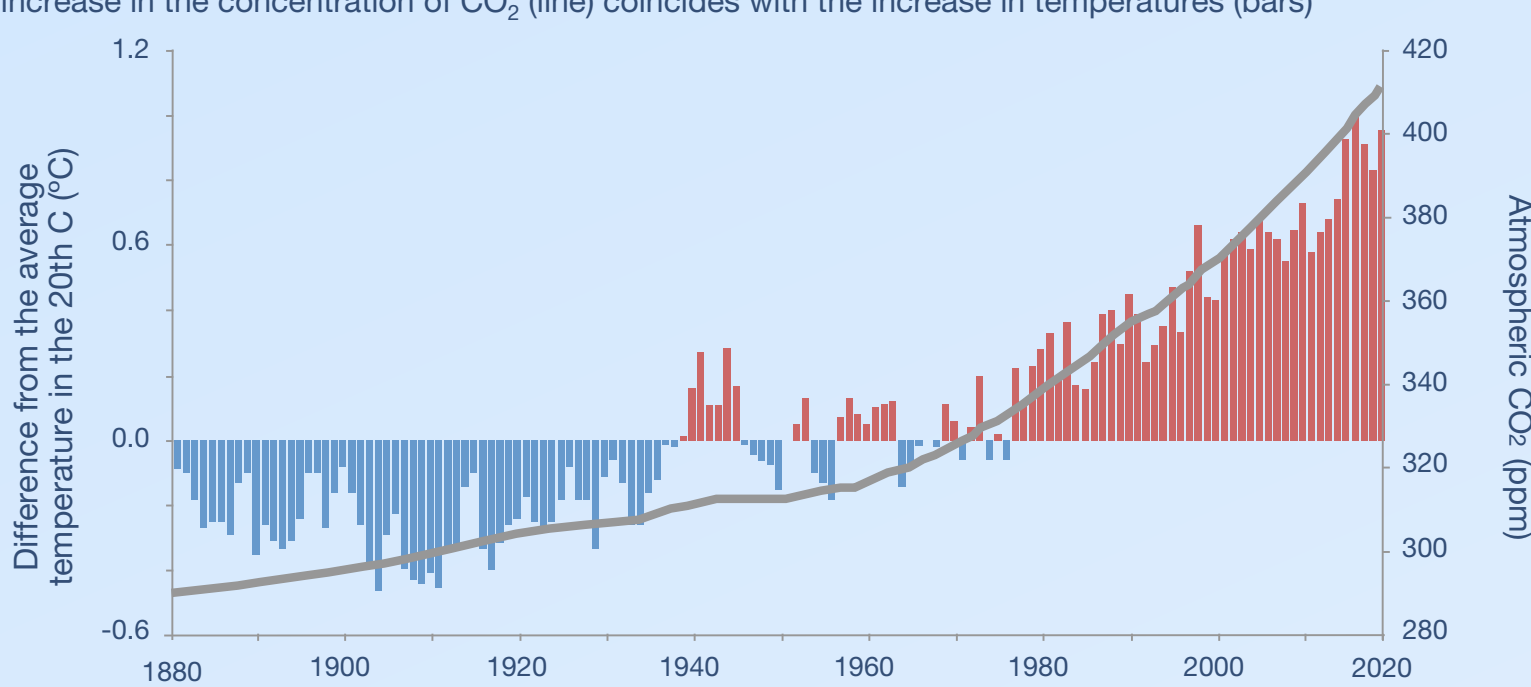


NOAA Climate gov.

### Climate change is a reality: the planet is heating up

19 of the hottest 20 years since records began have occurred since 2001.

The increase in the concentration of CO<sub>2</sub> (line) coincides with the increase in temperatures (bars)



NOAA Climate gov.

A number of indicators point to this warming.

- 90 %** of the extra heat is absorbed by the oceans
- 84 %** of ocean waters experienced at least one marine heatwave in 2019
- 23 %** of annual CO<sub>2</sub> emissions are absorbed by the ocean, which is acidifying

The oceans' oxygen inventory has decreased by **1-2 %**

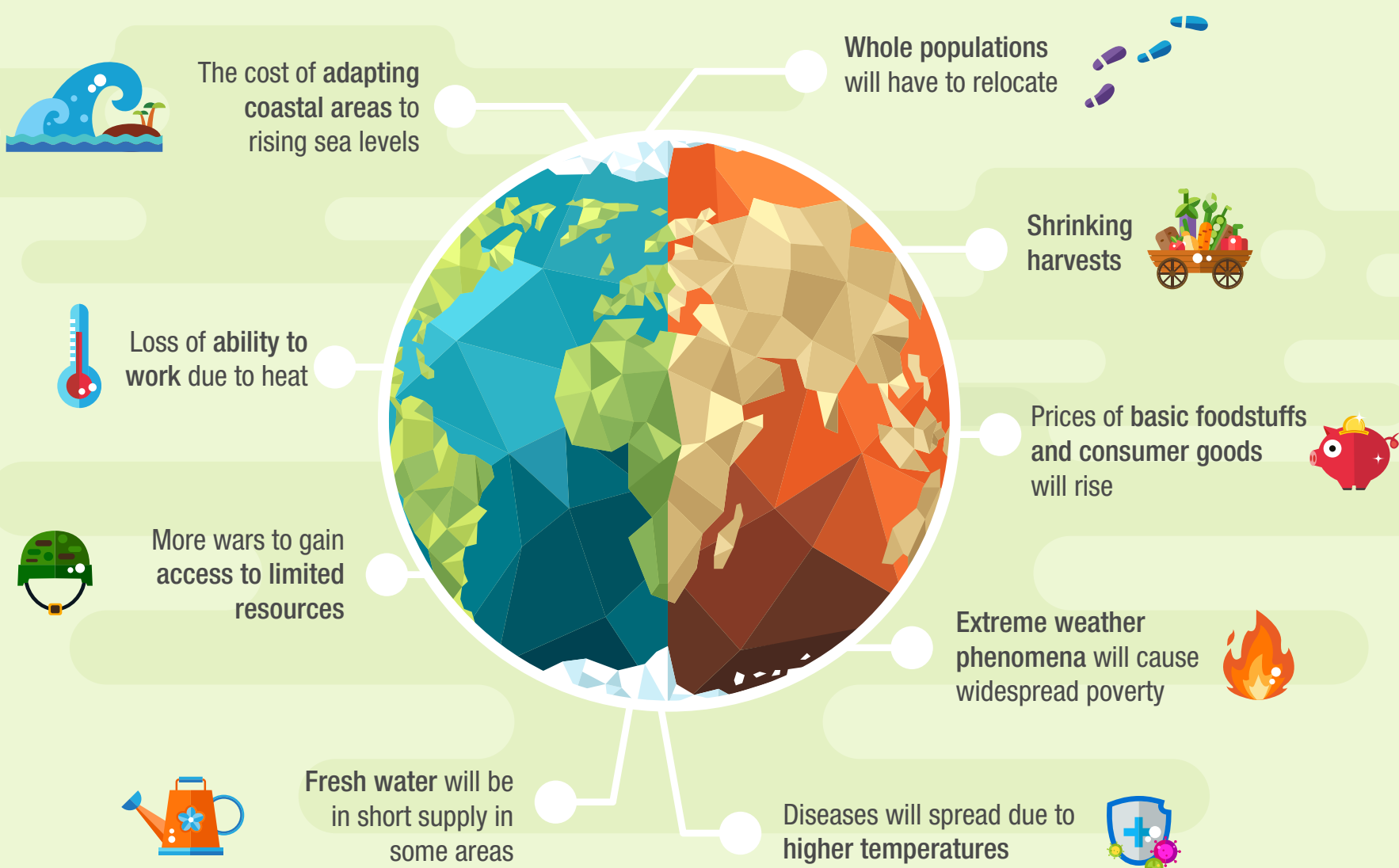
Estimated rate of increase  
**Sea level rise**  
**+3.2 mm/year**

**Antarctic**  
**5X** loss of the ice sheet mass in 2007-2017 as compared to 1997-2006

**Extreme events** + Their frequency and/or intensity are increasing

### With a considerable effect on human welfare and all sectors of activity

Their impact directly or indirectly influences natural and socio-economic systems.



### Some climate change is inevitable, even if we keep the warming below 2 °C, and it will require action to adapt...

Comparison of some effects expected in 2021 in certain scenarios

Warming by 2100	<2 °C		3 °C	5 °C
	1,5 °C	2 °C		
Physical effects				
Rise of the sea level (cm)	0.3-0.6 m	0.4-0.8 m	0.4-0.9 m	0.5-1.7 m
Probability of an ice-free Arctic in summer	1 in 30	1 in 6	4 in 6 (63 %)	6 in 6 (100 %)
Tropical cyclones:				
Less intense (#cat 1-5)	-1 %	-6 %	-16 %	Unknown
More intense (#cat 4-5)	+24 %	+16 %	+28 %	+55 %
Frequency of extreme precipitation	+17 %	+36 %	+70 %	+150 %
Increase in the extent of fires	x1.4	x1.6	x2.0	x2.6
People exposed to extreme heatwaves	x22	x27	x80	x300
Surface of the earth habitable for malaria	+12 %	+18 %	+29 %	+46 %

© CRO Forum, The heat is on, insurability and resilience in a changing climate

### ...but mitigation action is vital: slowing down each one-tenth of a degree rise in temperature will prevent the effects from increasing exponentially

Climate neutrality must be reached by 2050 to limit the increase in global temperatures by 2100 to below 1.5 °C

Although some change is inevitable, it will minimise the problem in the medium and long-term and reduce the costs of adapting to the future

### Climate action will have a profound effect on the global climate

Worldwide efforts to reduce emissions must be accompanied by actions to adapt to the changing conditions in order to face up to this challenge.

