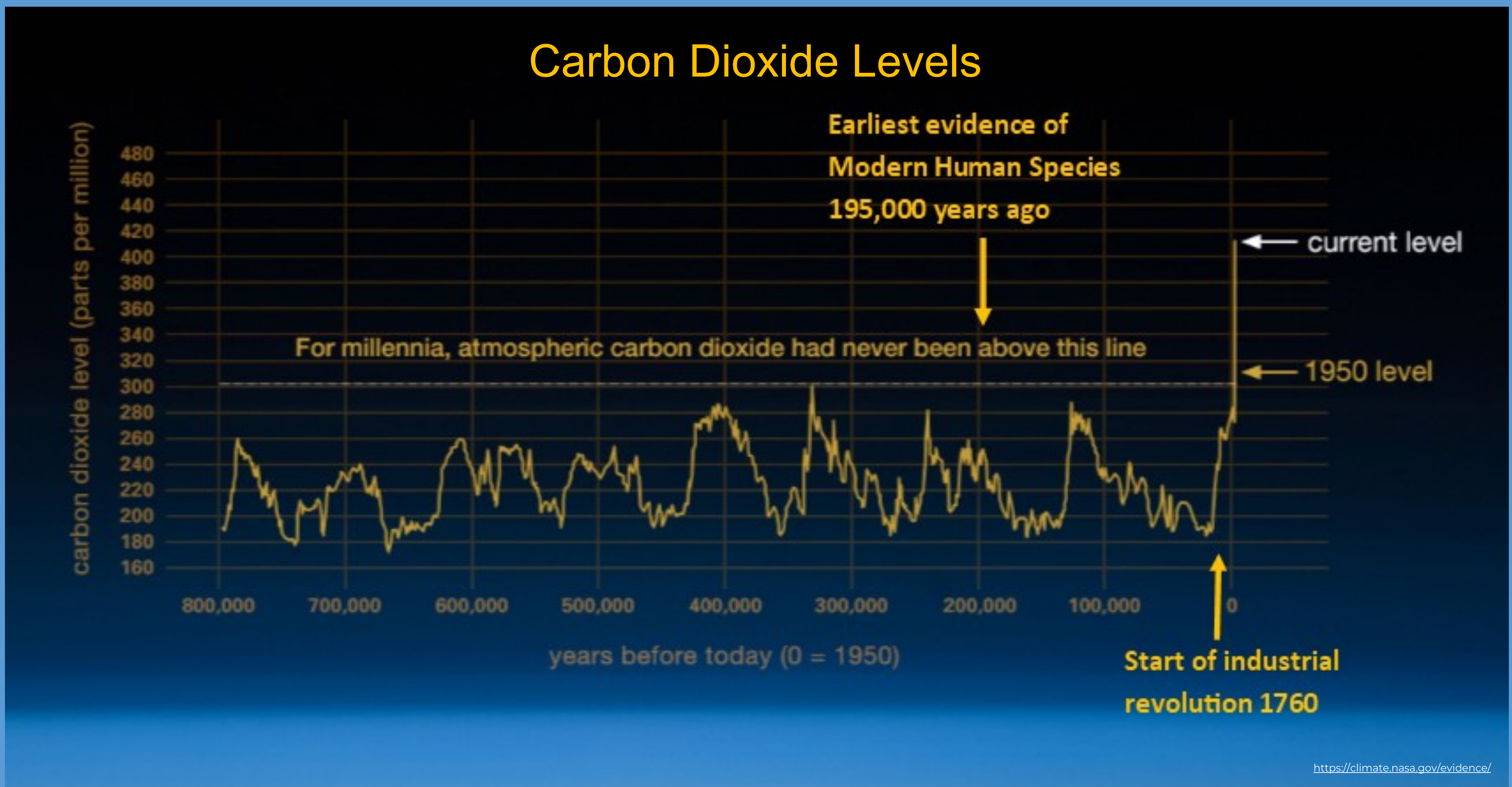




# Global Climate Change

## The Climate We Have Created

The graph below, from the NASA website, shows carbon dioxide (CO<sup>2</sup>) levels over the last 800,000 years. The peaks and troughs follow the Earth's naturally shifting climate, moving from ice ages to warmer interglacial periods and back again. In just the last 650,000 years there have been seven of these cycles.



This cycle of ice ages is caused by very small variations in the Earth's orbit, which change the amount of solar energy our planet receives.

Within these natural cycles, the Earth's climate has been stable enough for many species to evolve, including us, and for our civilisations to develop.

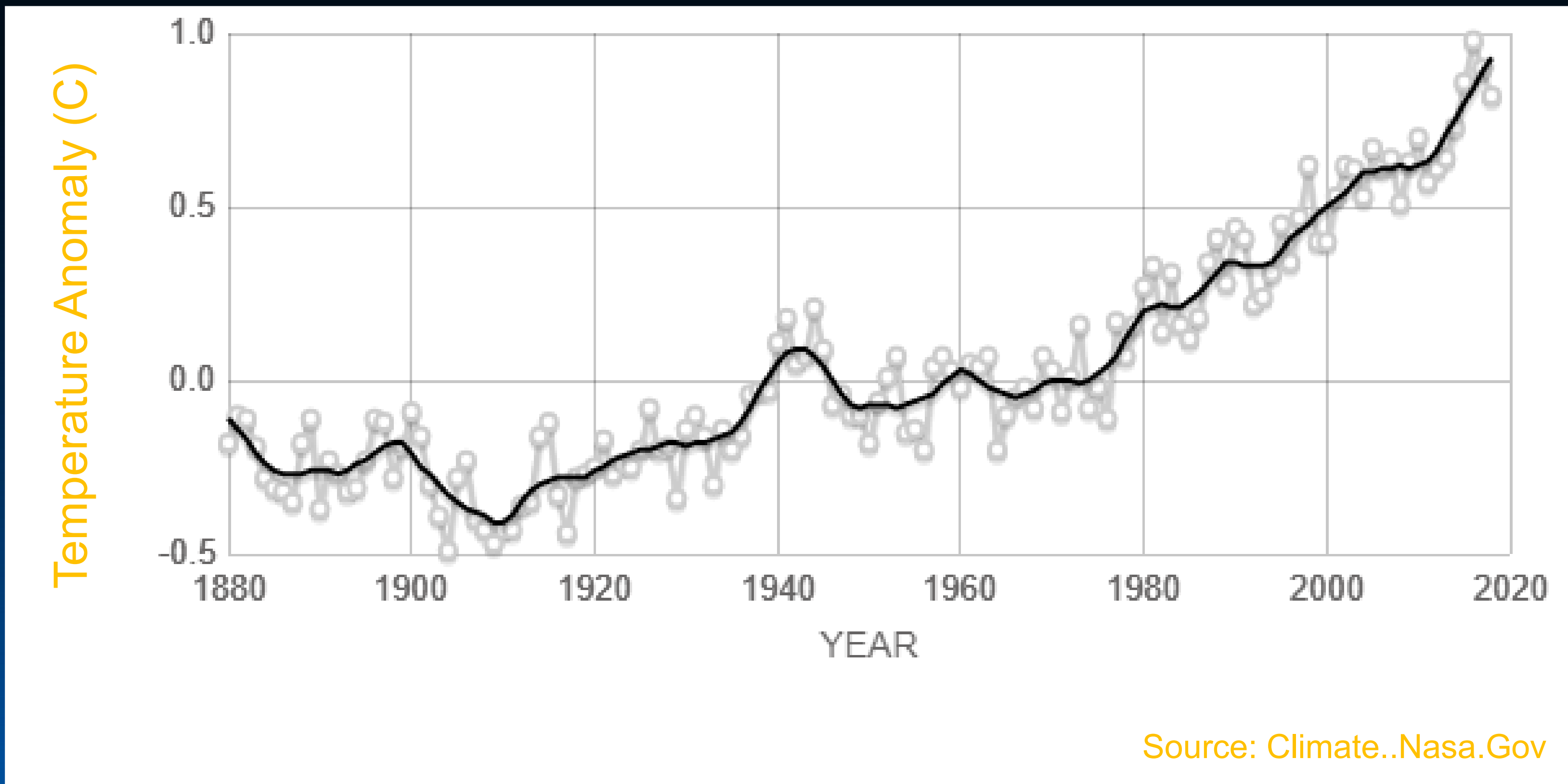
Since the industrial revolution human activities have caused a large spike in CO<sup>2</sup> levels, increasing the greenhouse effect of Earth's atmosphere and causing the average global temperature to increase beyond the natural variations.





The 2018 global average temperature showed an increase of 0.9°C since 1880, with the calculation for 2019 expected to be even higher. Two-thirds of this warming has occurred since 1975, meaning the rate of warming is around ten times that seen at the end of an ice age.

## Global Land-Ocean Temperature Index



The IPCC (Intergovernmental Panel on Climate Change) is part of the United Nations and provides the world with objective, scientific information about the risks of human-induced climate change. The fifth IPCC report stated:

*“This current warming trend is of particular significance because it is extremely likely (greater than 95 percent probability) to be the result of human activity since the mid-20th century.”*

— IPCC, Climate Change 2014 Synthesis Report 2014

### How Hot Could We Get?

Current emissions reduction plans are set out in the Paris Agreement and see us heading for increased global temperatures of 3°C or more.

In a 2017 report the IPCC showed that at the current rate of warming we will reach 1.5°C between 2030 and 2052.

The impacts of this will be much worse than what we are currently experiencing at 0.9°C, but still substantially lower than at 2°C. Increases of 3°C would have devastating consequences.

	1.5°C	2°C	2°C IMPACTS		1.5°C	2°C	2°C IMPACTS
<b>EXTREME HEAT</b> Global population exposed to severe heat at least once every five years	14%	37%	2.6x WORSE	<b>ECOSYSTEMS</b> Amount of Earth's land area where ecosystems will shift to a new biome	7%	13%	1.86x WORSE
<b>SEA-ICE-FREE ARCTIC</b> Number of ice-free summers	AT LEAST 1 EVERY 100 YEARS	AT LEAST 1 EVERY 10 YEARS	10x WORSE	<b>PERMAFROST</b> Amount of Arctic permafrost that will thaw	4.8 MILLION KM <sup>2</sup>	6.6 MILLION KM <sup>2</sup>	38% WORSE
<b>SEA LEVEL RISE</b> Amount of sea level rise by 2100	0.40 METERS	0.46 METERS	.06M MORE	<b>CROP YIELDS</b> Reduction in maize harvests in tropics	3%	7%	2.3x WORSE

