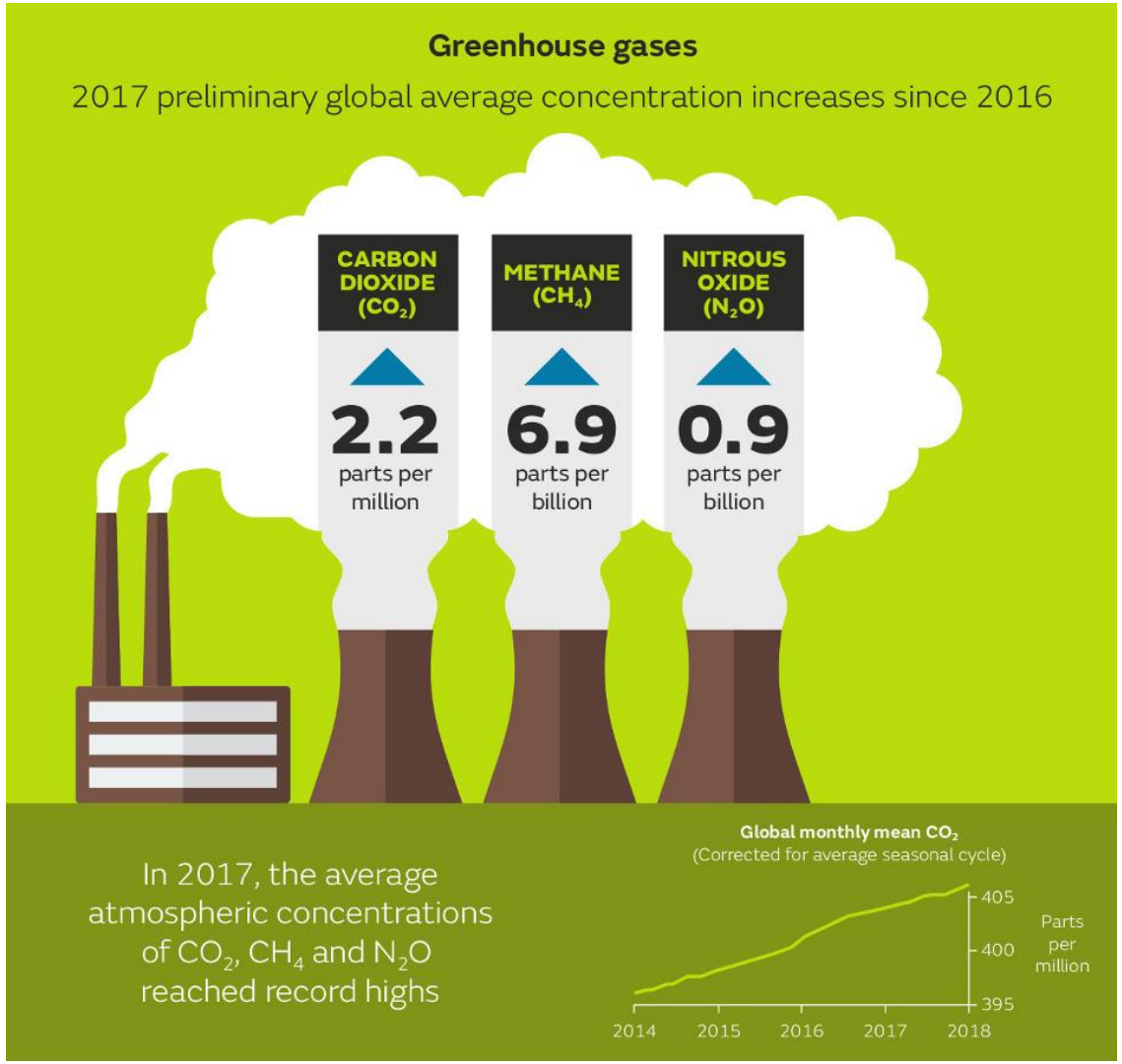
What is Climate Change?

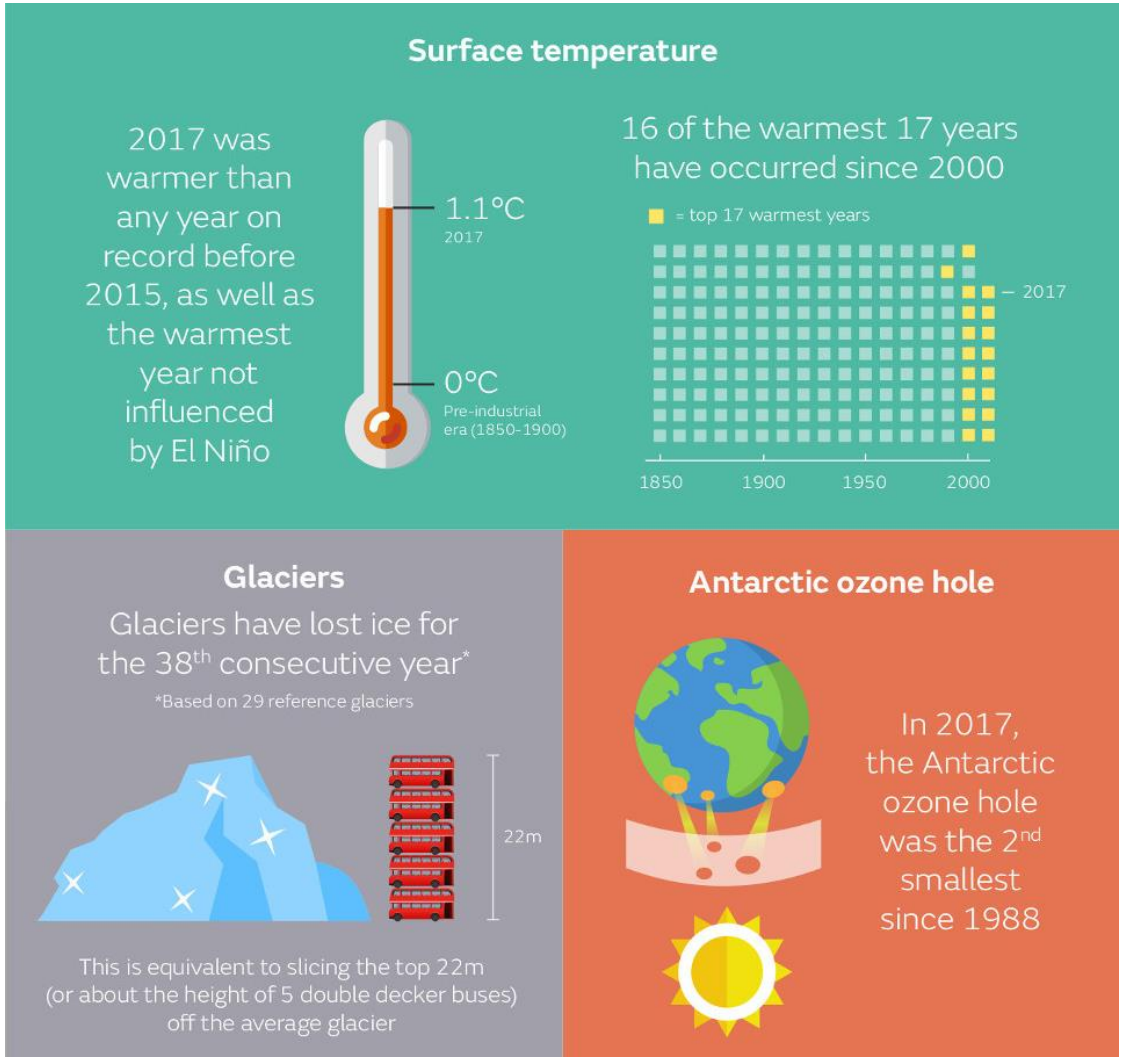
Climate Change is a large-scale, long-term shift in the planet's weather patterns and average temperatures. Earth has had tropical climates and ice ages many times in its 4.5 billion years. So what's happening now?

- Since the last ice age, which ended about 11,000 years ago, Earth's climate has been relatively stable, with an average global temperature of about 14 °C.

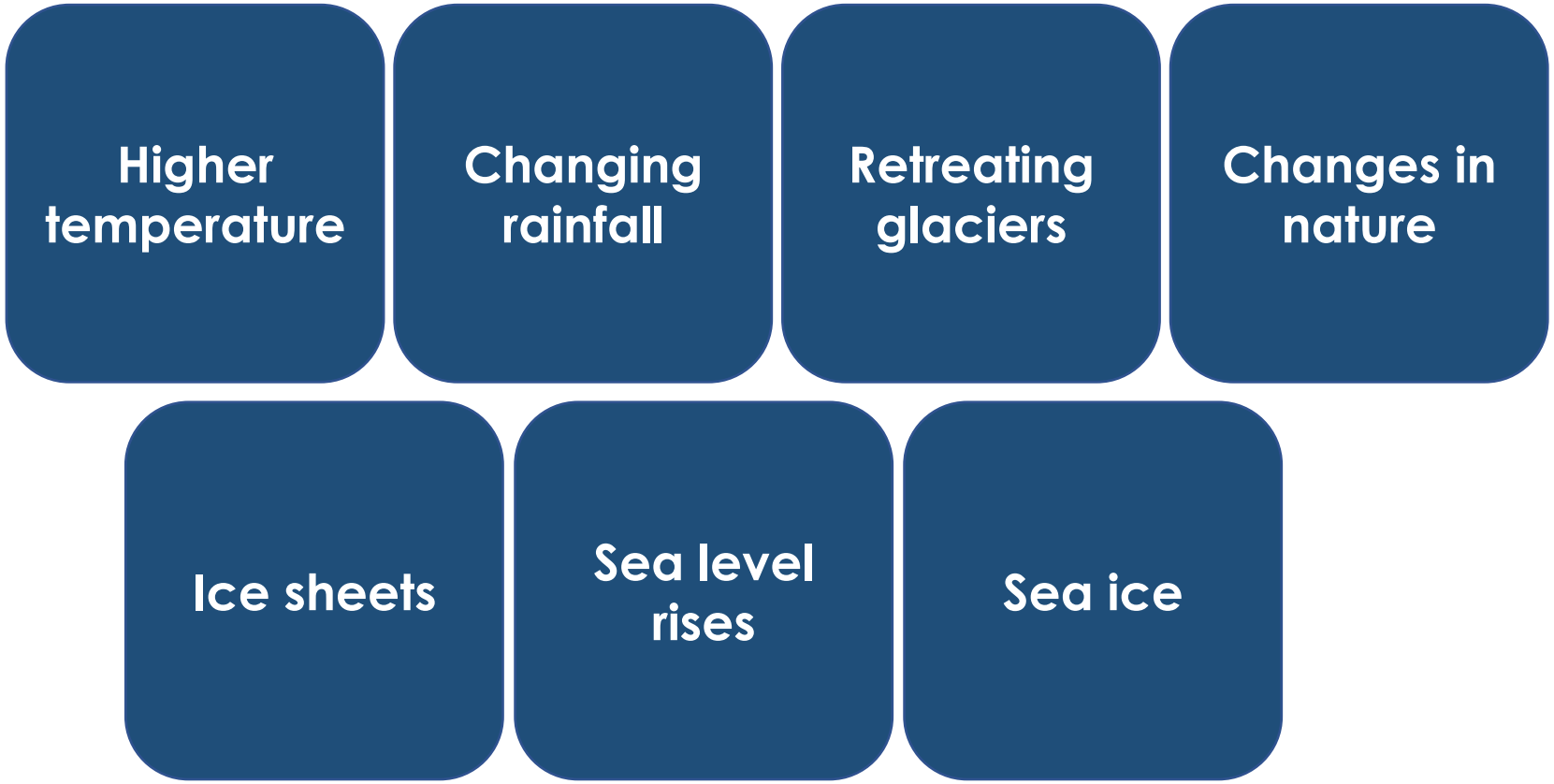


What is Climate Change?

- Global temperatures have risen significantly over the 20th and 21st centuries, driven primarily by the rise in atmospheric carbon dioxide (CO_2). Since the Industrial Revolution, atmospheric CO_2 has increased by over 40% to levels that are unprecedented in at least 800,000 years. This has caused warming throughout the climate system, and multiple indicators show evidence that our climate is changing.
- The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased.

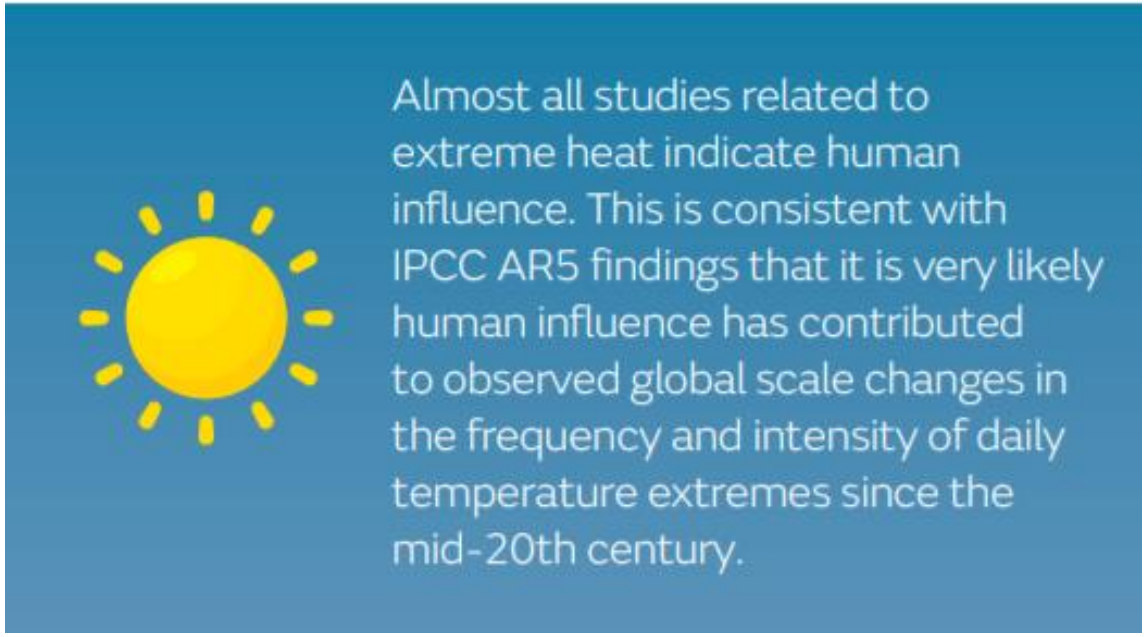


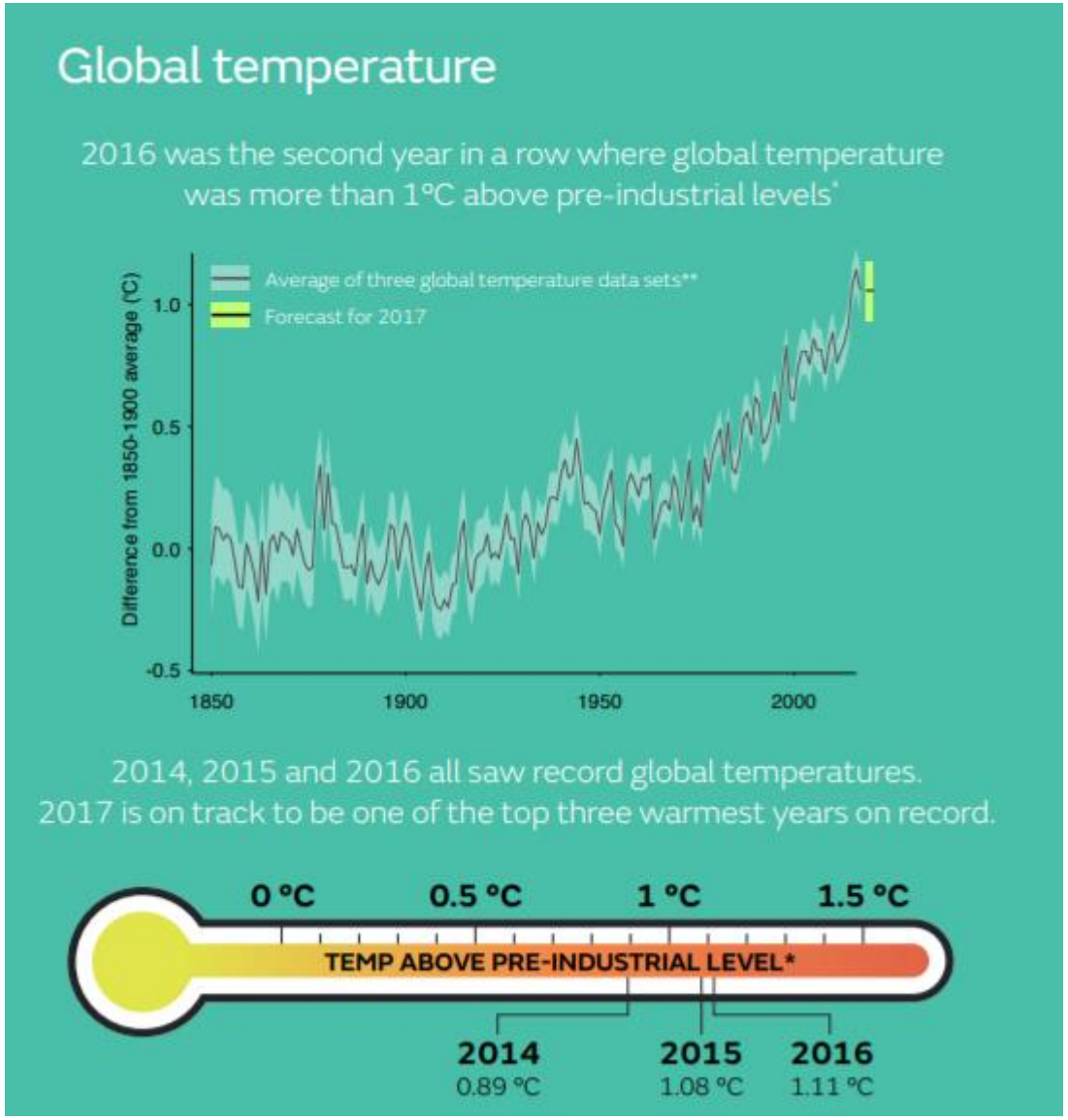
Climate Change Effects



Climate Change Effects: Higher temperatures

Global average surface temperature has increased by about 1 °C since the 1850s. Each of the last three decades has been successively warmer than any other preceding decade in the instrumental record, and 16 of the 17 warmest years on record have occurred since the year 2001.

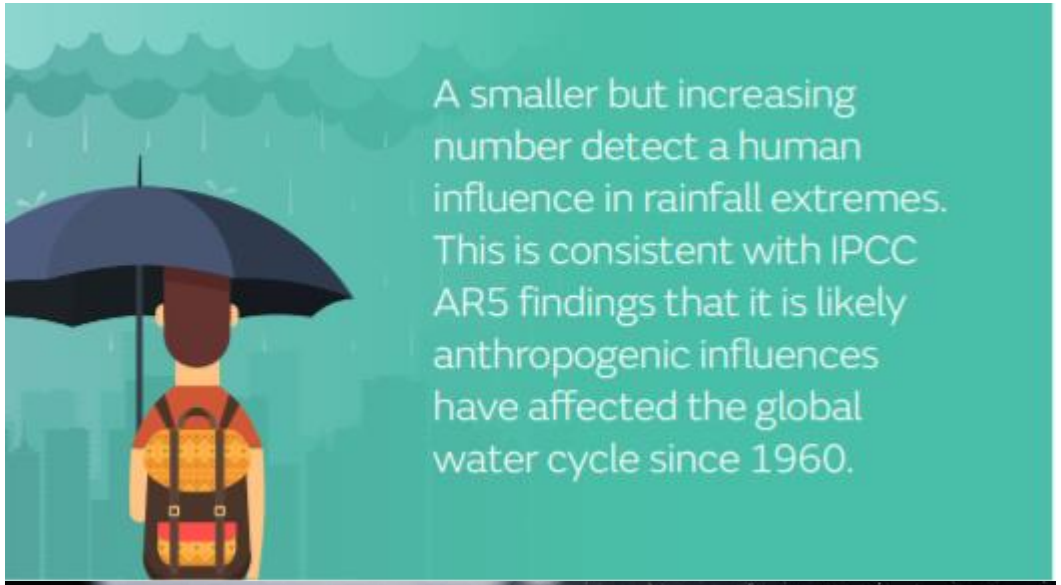




Climate Change Effects: Changing rainfall

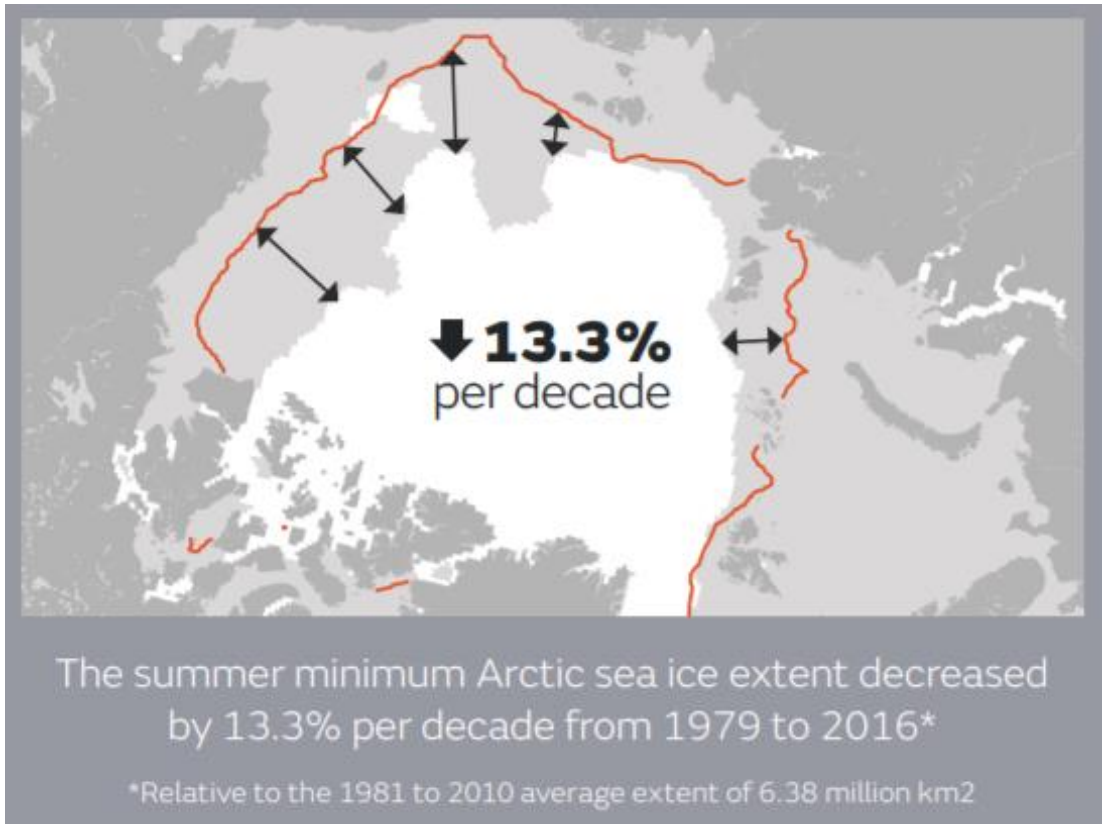
Observations show that rainfall has increased in the mid-latitudes of the northern hemisphere since the beginning of the 20th century. There are also changes between seasons in different regions.

- *For example, the UK's summer rainfall is decreasing on average, while winter rainfall is increasing. There is also evidence that heavy rainfall events have become more intensive, especially over North America. Longer-term records of rainfall are needed for some areas to resolve any trends from natural variability.*



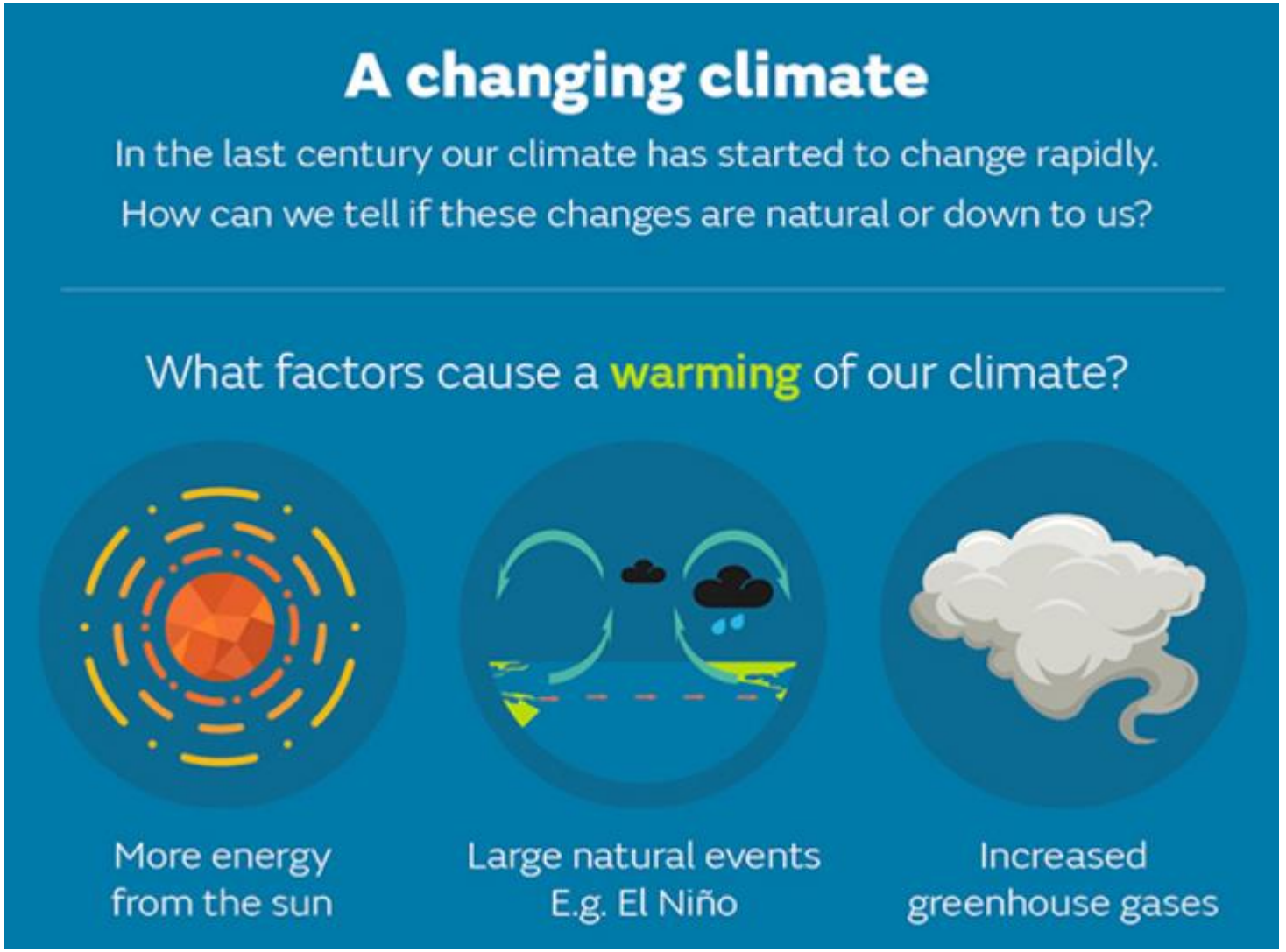
Climate Change Effects: Retreating glaciers

Glaciers all over the world - in the Alps, Rockies, Andes, Himalayas, Africa and Alaska - are melting and the rate of shrinkage has increased in recent decades.



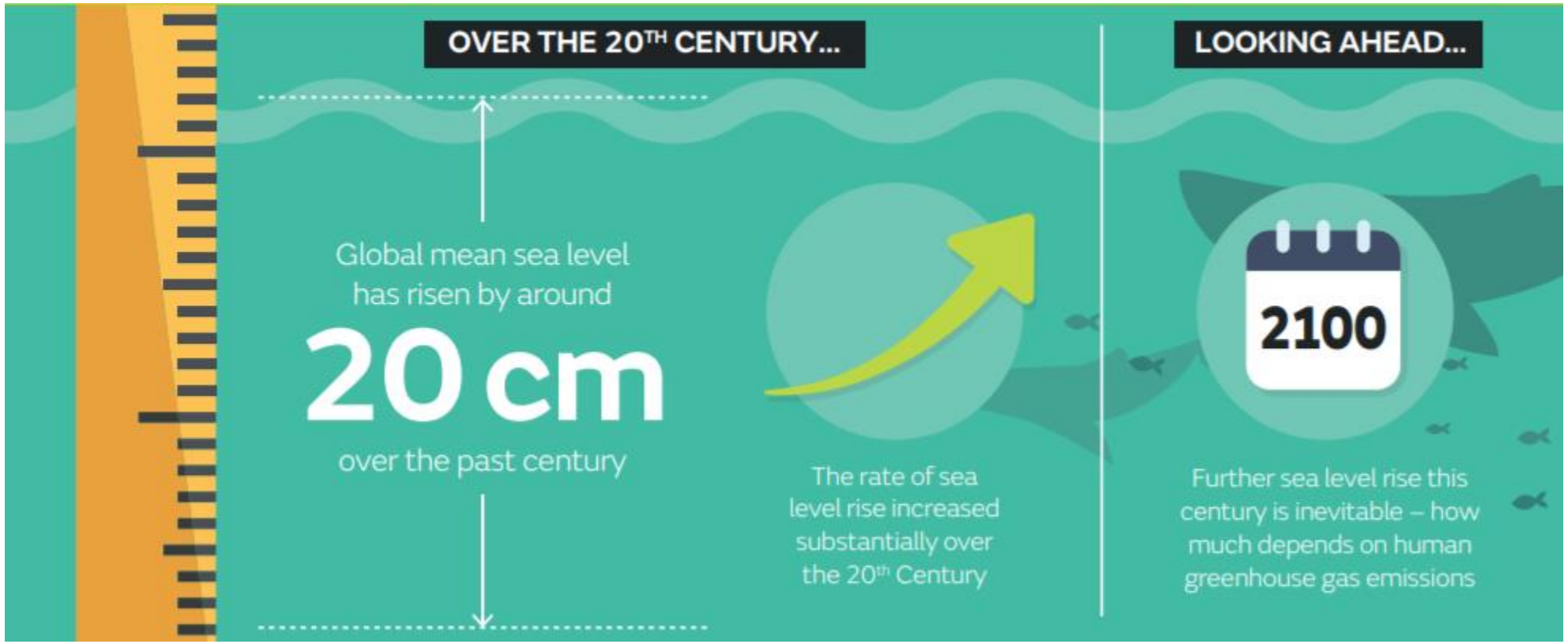
Climate Change Effects: Changes in nature

Changes in the seasons (such as the UK spring starting earlier, autumn starting later) are bringing changes in the behavior of species, for example, butterflies appearing earlier in the year and birds shifting their migration patterns.



Climate Change Effects: Sea level rises

Since 1900, global mean sea level has risen by more than 20 cm. The rate of sea-level rise has increased in recent decades: from around 1.7 mm per year over the last century, to 3.3 mm per year since the early 1990s.



Climate Change Effects: Sea ice

Arctic sea-ice has been declining since the late 1970s, reducing in extent by about 4%, or 0.6 million square kilometres (an area about the size of Madagascar) per decade. The summer minimum Arctic sea ice extent has decreased by 13.3% per decade since 1979. At the same time Antarctic sea-ice has been more stable, though most areas have been at very low levels since autumn 2016.

Climate Change Effects: Ice sheets

The Greenland and Antarctic ice sheets, which between them store the majority of the world's fresh water, are both shrinking at an accelerating rate.

Arctic sea ice extent, September 2018, compared to the record low year of 2012 and the 1981-2010 average, with regions named in the text labelled. Data are from HadISST1.2.