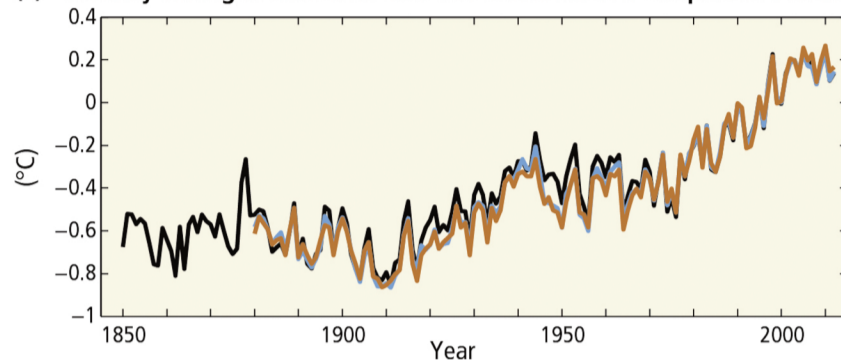
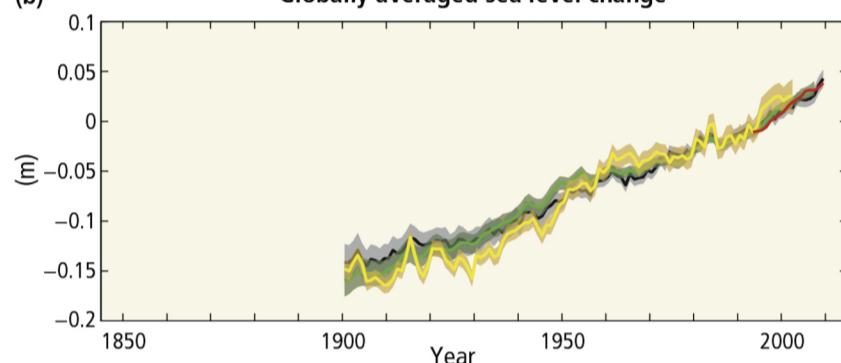


Climate change and the Doomsday Clock

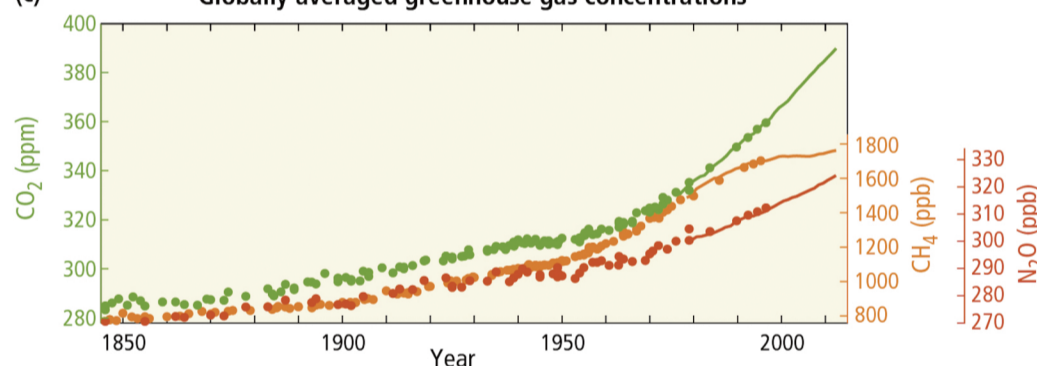
(a) Globally averaged combined land and ocean surface temperature anomaly



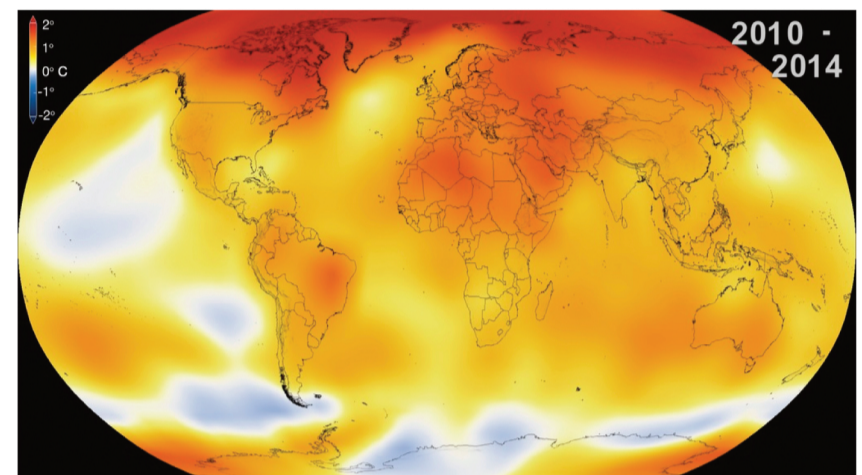
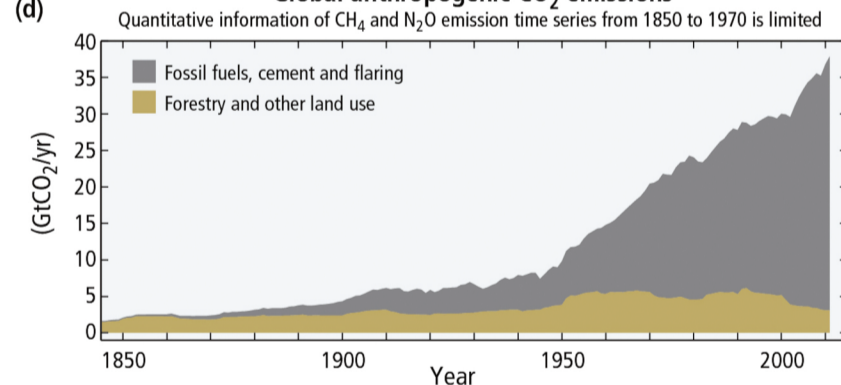
(b) Globally averaged sea level change



(c) Globally averaged greenhouse gas concentrations



(d) Global anthropogenic CO₂ emissions



This map displays global surface temperature anomalies. Higher than normal temperatures are shown in red.

This map represents the global temperatures 5-year averaged from 2010 to 2014. Source: NASA visualisation studio.

Observations and other indicators of a changing global climate system.

Observations:

(a) Annually and globally averaged combined land and ocean surface temperature anomalies relative to the average over the period 1986 to 2005 in the longest-running dataset. Colours indicate different data sets.

(b) Annually and globally averaged sea level change relative to the average over the period 1986 to 2005 in the longest-running dataset. Colours indicate different data sets.

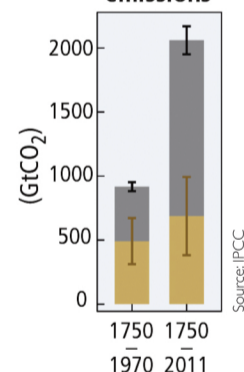
(c) Atmospheric concentrations of the greenhouse gases carbon dioxide (CO₂, green), methane (CH₄, orange) and nitrous oxide (N₂O, red) determined from ice core data (dots) and from direct atmospheric measurements (lines).

Indicators:

(d) Global anthropogenic CO₂ emissions from forestry and other land use as well as from burning of fossil fuel, cement production and flaring. Cumulative emissions of CO₂ from these sources and their uncertainties are shown as bars and whiskers, respectively, on the right hand side.

The global effects of the accumulation of CH₄ and N₂O emissions are shown in panel c.

Cumulative CO₂ emissions



Many of the observed changes are unprecedented over timescales of decades to millennia.

For example:

- Each of the past three decades has been successively warmer at the Earth's surface than any preceding decade since 1850.
- The period from 1983 to 2012 was the warmest 30-year period of the past 1400 years in the Northern Hemisphere.
- The globally averaged combined land and ocean surface temperature data show a warming of 0.85 °C over the period 1880 to 2012.
- Over the period 1992 to 2011, the Greenland and Antarctic ice sheets have been losing mass. Glaciers are shrinking worldwide. The annual mean Arctic sea-ice extent decreased over the period 1979 to 2012, at a rate of 3.5 to 4.1% per decade.
- Over the period 1901 to 2010, global mean sea level rose by 0.19 m. The main cause of climate change is an increase in the emission of greenhouse gases, which is largely driven by economic development and population growth, and the use of fossil fuels. As a result, atmospheric concentrations of carbon dioxide, methane and nitrous oxide are now higher than at any time in the past 800,000 years.

The effects of climate change are being felt in the UK:

- The average temperature in the UK is now 1 °C higher than it was 100 years ago and 0.5 °C higher than it was in the 1970s.
- The ten warmest years on record have all occurred since 1990.
- Seven of the ten wettest years on record have occurred since 1998.
- Sea level rose by 14 cm during the 20th century.
- Winter rainfall has increased over the past 50 years, with increasing heavy rainfall events leading to widespread flooding.



IT IS 3 MINUTES TO MIDNIGHT

The Doomsday Clock is designed to warn the public about how close we are to destroying the world with our technology. First developed by the Bulletin of the Atomic Scientists in 1947, the Clock was initially designed to raise awareness of the risks of nuclear war. Since then it has been updated 21 times, following advice from leading scientists.

Since 2007, the potential impacts of climate change have been considered when setting the Clock.

Currently the Clock stands at 3 minutes to midnight.

There is scientific consensus that the Earth's climate system is changing as a result of human interference. In recent decades, the atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen.

But what does climate change mean for us?

How might it affect our own lives, and the places and wildlife that we enjoy?