

analogy to describe importance heat and influencing Earth's temperature

■ 1859: Irish physicist John water vapour and carbon dioxide as heattrapping aases

- **1896:** Swedish chemist Svante Arrhenius concludes that CO2 emissions from industrialage coal burning will enhance greenhouse effect - first suggestion that human activity produces greenhouse gases
- 1938: British engineer Guy Callendar first suggests that fossil fuel burning is responsible for observed warming of world's
- climate **1958**: American scientist Charles Keeling makes first direct measurement of atmospheric CO2 at Mauna Loa, Hawaii

CO2 concentration (parts per million) 370 360

310

1955

350 340 "Keeling Curve" 330 becomes crucial 320 tracker of CO2 rise

Climate change milestones

■ 1991: Debris from eruption

of Mount Pinatubo volcano in

Philippines shields Earth from

solar energy, causing

global temperature

■ 1965: U.S. advisory panel warns that greenhouse effect is a matter of "real concern"

■ 1975: U.S. scientist Wallace Broecker introduces term "alobal warming" into public domain in title of scientific paper

Tyndall identifies 1979: First World Climate Conference urges governments "to foresee and prevent potential man-made changes in climate"

■ 1987: Montreal Protocol signed, restricting chemicals that deplete ozone layer. Although not established with climate change in mind, it has

1988: UN sets

up Intergovernmental

to collate and analyse

Panel on Climate Change

evidence on global warming

■ 1990: First IPCC report

are significantly adding to

states that human activities

concentrations of greenhouse

gases and documents global

0.5-degree Celsius increase

in temperature

over past 100

vears

major impact on greenhouse gas emissions

to fall for two years before rising again

■ 1992: UN Earth Summit in Rio de Janeiro creates Framework Convention on Climate Change - developed countries agree to cut emissions to 1990 levels

■ 1997: Kyoto Protocol sets binding targets for industrialised nations to reduce emissions by 5% against 1990 levels over period 2008-2012

■ 1998: Strong El Niño conditions warming warmest year



■ 2002: Larsen B Ice Shelf over 3,000 sq. km in size breaks off Antarctic peninsula



2003: Europe's worst heatwave in 500 years kills an estimated 30,000, accelerating divergence between European and U.S. public opinion



- 2005: Kvoto Protocol comes into force
- 2006: China overtakes U.S. as world's biggest CO2 emitter, but U.S. remains well ahead on per-capita basis
- combine 2007: IPCC states that with global "warming of climate is unequivocal" and places blame to produce firmly on human activity

Oct: IPCC and former U.S. vice-president Al Gore share Nobel Peace Prize for efforts to spread awareness of climate change

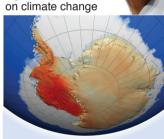
> 2007: Arctic sea ice shrinks to lowest extent on record

> > **Arctic** summers predicted to be ice-free within decades



due to rapid melting of its Arctic sea-ice habitat Nov: U.S. presidentelect *Barack* **Obama** vows to "engage

vigorously" in talks



- 2009: New evidence shows Antarctica is warming rapidly, leaving Wilkins Ice Shelf largest of its kind - on brink of breaking away
- Oct: International Energy Agency says global economic crisis has led to fall of carbon emissions by 3% in 2009, giving world leaders unexpected opportunity to take decisive

action on global warming



Dec 7: 192 governments convene for UN summit in Copenhagen to negotiate new climate change treaty

2015 Sources: NOAA, AIP, UK Met Office, EOEARTH

Pictures: Associated Press, Getty Images, NASA/GSFC Scientific Visualization Studio