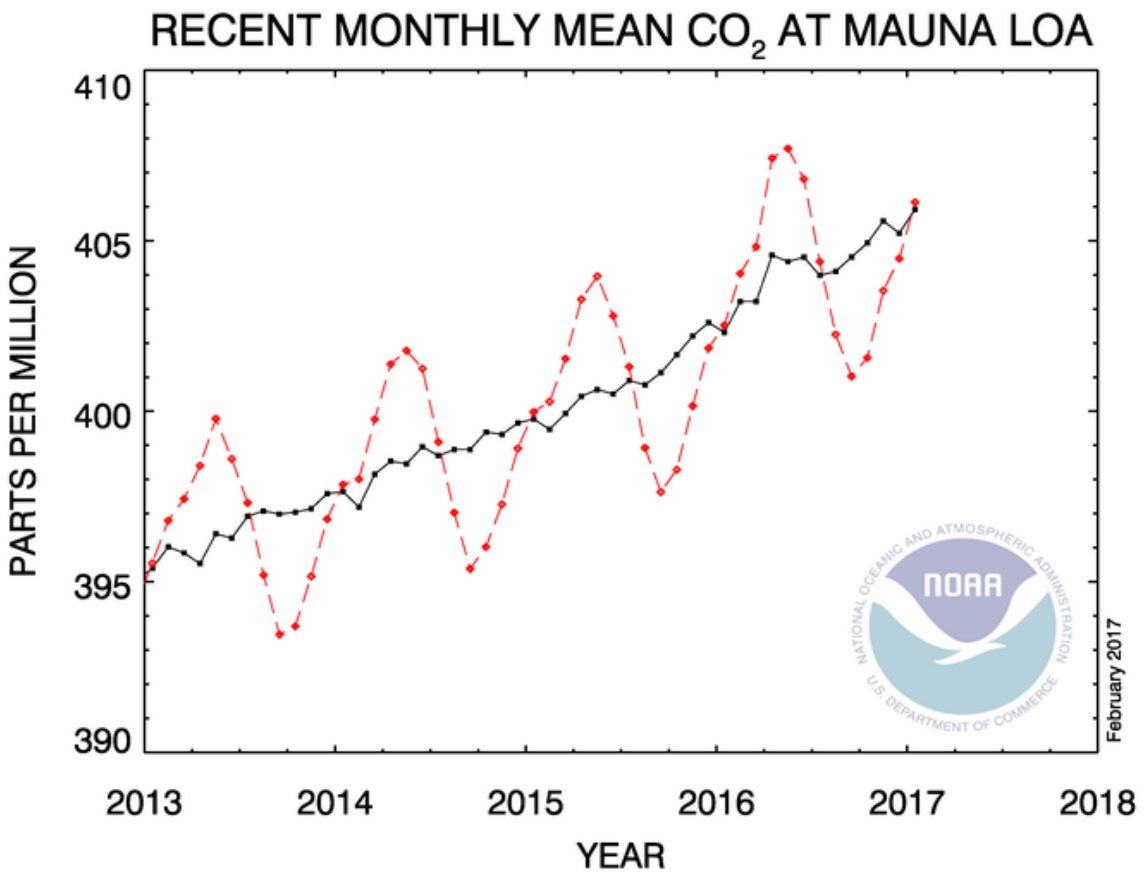
IEAGHG Information Paper: 2017-IP11; Global heat continues, sea ice hits new record lows

The World Meteorological Organisation (WHO) reported in February 2017 the extended spell of high global temperatures is continuing, with the Arctic witnessing exceptional warmth and – as a result – record low Arctic sea ice volumes for this time of year. Antarctic sea ice extent is also the lowest on record. See: *https://public.wmo.int/en/media/news/global-heat-continues-sea-ice-hits-new-record-lows*

The WMO indicated that reports from the NOAA (Annex 1) and NASA[1] said that global average surface temperatures for the month of January were the third highest on record, after January 2016 and January 2007. NOAA said that the average temperature was 0.88°C above the 20th century average of 12°C. The European Centre for Medium Range Weather Forecasts, Copernicus Climate Change Service, said it was the second warmest[2].

THE WMO reported that natural climate variability – such as El Niño and La Niña – mean that the globe will not break new temperature records every month or every year. More significant than the individual monthly rankings is the long-term trend of rising temperatures and climate change indicators such as CO_2 concentrations (406.13 parts per million at the benchmark Mauna Loa Observatory in January 2017 compared to 402.52 ppm in January 2016), see:

https://www.esrl.noaa.gov/gmd/ccgg/trends/index.html



[1] https://data.giss.nasa.gov/gistemp/news/20170215/

[2] https://climate.copernicus.eu/resources/data-analysis/average-surface-air-temperature-analysis/monthly-maps/january-2017

The largest positive temperature departures from the average in January were seen across the eastern half of the contiguous U.S.A, Canada, and in particular the Arctic. The high Arctic temperatures also persisted in the early part of February.

According to the WMO, at least three times so far this winter, the Arctic has witnessed the Polar equivalent of a heatwave, with powerful Atlantic storms driving an influx of warm, moist air and increasing temperatures to near freezing point. The temperature in the Arctic Archipelago of Svalbard, north of Norway, topped 4.1°C on 7 February 2017. The world's northernmost land station, Kap Jessup on the tip of Greenland, swung from -22°C to +2°C in 12 hours between 9 and 10 February, according to the Danish Meterological Institute.

The WMO reports quotes the World Climate Research Programme Director David Carlson who suggests that:

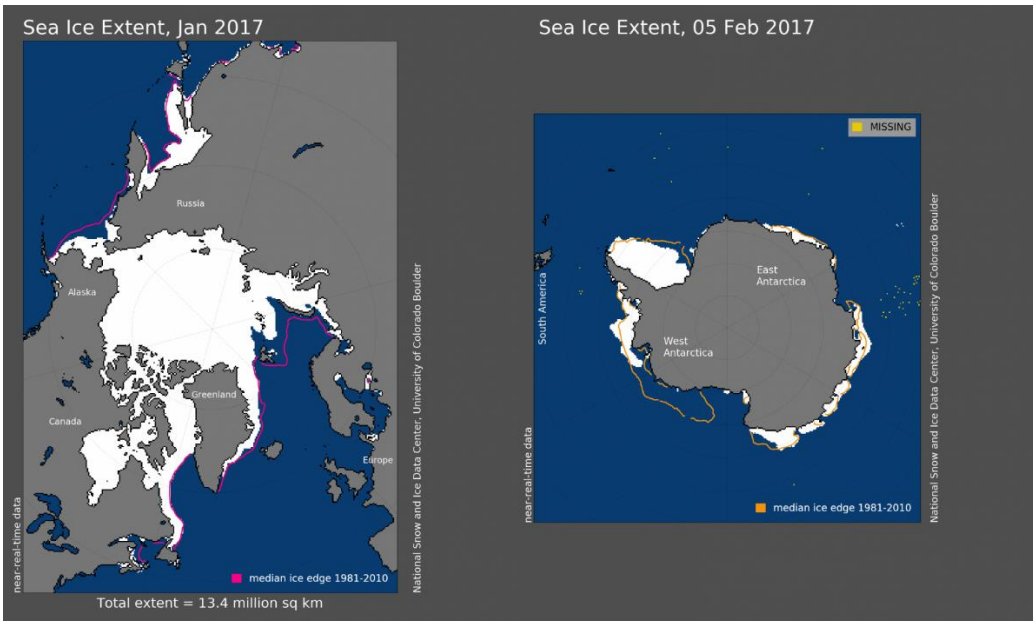
"Temperatures in the Arctic are quite remarkable and very alarming,"

"The rate of change in the Arctic and resulting shifts in wider atmospheric circulation patterns, which affect weather in other parts of the world, are pushing climate science to its limits."

The WMO suggest that as a result of waves in the jet stream – the fast moving band of air which helps regulate temperatures – much of Europe, the Arabian Peninsula and North Africa were unusually cold, as were parts of Siberia and the western USA.

Sea ice extent was the lowest on the 38-year-old satellite record for the month of January, both at the Arctic and Antarctic, according to both the U.S. National Snow and Ice Data centre[3] (NSIDC) and Germany's Sea ice Portal operated by the Alfred-Wegener-Institute[4].

Arctic sea ice extent averaged 13.38 million square kilometres in January, according to NSDIC. This is 260,000 square kilometres below January 2016, the previous lowest January extent – an area bigger than the size of the United Kingdom. It was 1.26 million square kilometres (the size of South Africa) below the January 1981 to 2010 long-term average.



[3] https://nsidc.org/arcticseaicenews/

[4] http://www.meereisportal.de/en/seaicemonitoring/sea-ice-observations-from-satellite-measurements/current-sea-ice-maps/

Again according to Mr Carlson

"*The recovery period for Arctic sea ice is normally in the winter, when it gains both in volume and extent. The recovery this winter has been fragile, at best, and there were some days in January when temperatures were actually above melting point,"*

"This will have serious implications for Arctic sea ice extent in summer as well as for the global climate system. What happens at the Poles does not stay at the Poles?"

Antarctic sea ice extent was also the lowest on record. A change in wind patterns, which normally spread out the ice, contracted it instead.

John Gale
27/02/17

ANNEX 1

NOAA Global Summary Information - January 2017

For reference see: https://www.ncdc.noaa.gov/sotc/summary-info

The globally averaged temperature over land and ocean surfaces for January 2017 was the third highest for the month of January in the NOAA global temperature dataset record, which dates back to 1880.

Global highlights: January 2017

- The January temperature across global land and ocean surfaces was 1.58°F above the 20th century average of 53.6°F. This was the third highest for January in the 1880–2017 record, behind 2016 (highest) and 2007 (second highest).
- The January globally averaged land surface temperature was 2.77°F above the 20th century average of 37.0°F. This value was also the third highest January land global temperature in the 1880–2017 record, behind 2007 (highest) and 2016 (second highest).
- The January globally averaged sea surface temperature was 1.17°F above the 20th century monthly average of 60.5°F—the second highest global ocean temperature for January in the 1880–2017 record behind 2016.
- According to data from NOAA analysed by the Rutgers Global Snow Lab, the Northern Hemisphere snow cover extent during January was 890,000 square miles above the 1981–2010 average. This was the sixth largest January Northern Hemisphere snow cover extent in the 51-year period of record. The North American snow cover extent was the 13th largest on record, while the Eurasian snow cover extent was the seventh largest.
- The average Arctic sea ice extent for January was 487,000 square miles (8.6 percent) below the 1981–2010 average. This was the smallest January extent since records began in 1979 and 100,000 square miles smaller than the previous record set in 2016, according to an analysis by the National Snow and Ice Data Center based on data from NOAA and NASA.
- The Antarctic sea ice extent for January was 432,000 square miles (22.8 percent) below the 1981–2010 average. This was the smallest January Antarctic sea ice extent since records began in 1979 and 110,000 square miles smaller than the previous record set in 2006.