A newsletter following global environmental issues alongside the cycle of the seasons in Southern England

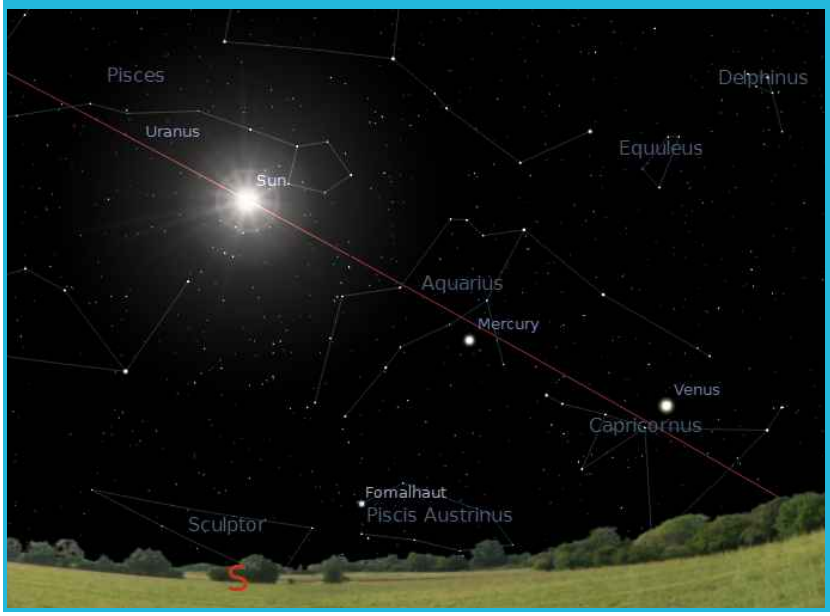
Prime Meridian

(25) May 6, 2014

Above: A spectacular photo of the Brookes Range, Alaska, on March 14, 2014, shortly before the equinox. It was taken in the course of NASA's ice monitoring mission Operation IceBridge. This aerial survey of the Earth's icy regions is filling a gap until the launch of a new ice monitoring satellite in 2016. Image: NASA/Michael Studinger.

Through the spring equinox 2014.

The Northern Hemisphere passed through its spring equinox on March 20, 2014. This was not merely a regular yearly event, but a milestone along the road of our changing climate.



A *Stellarium* simulation shows the Sun and planets against the starry background. This is the view that would have been seen from London, UK at noon on March 20, 2014, had the atmosphere with its glare and clouds not intervened.

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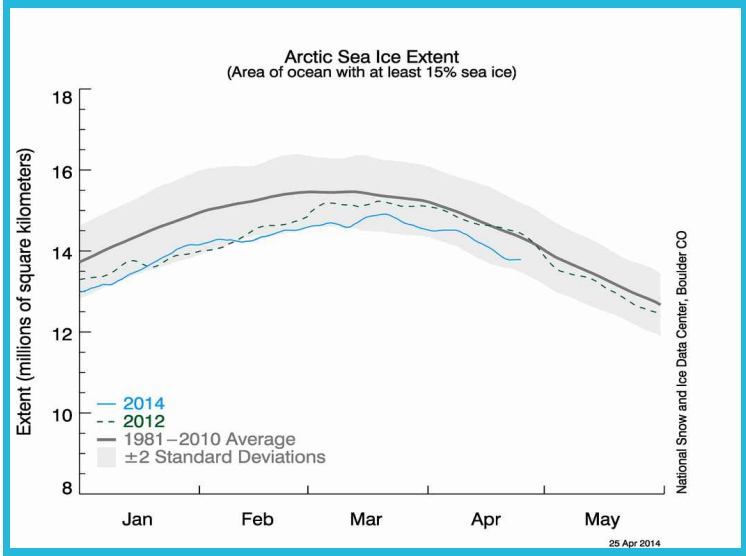
Even at its maximum extent, Arctic sea ice is dwindling in a warmer world.



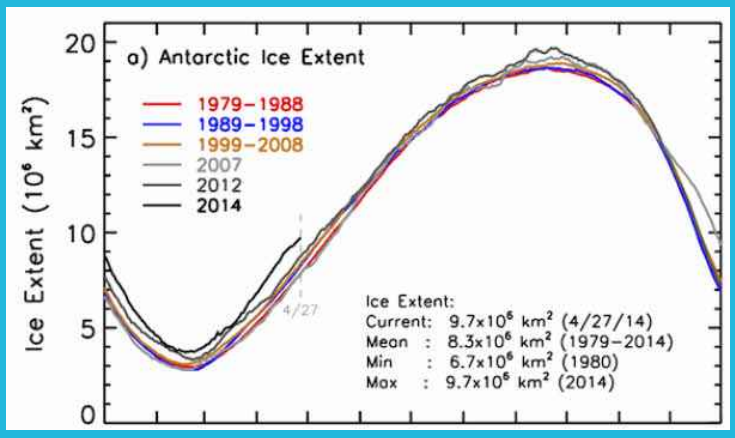
According to the USA's National Snow and Ice Data Center, March 21, 2014, the day after the equinox, saw the maximum annual extent of the floating Arctic sea ice, which had been building up during the dark Arctic winter (left). Ice "*extent*" is the area over which sea ice covers at least 15% of the sea surface. It depends not only on the temperature of the sea, but also on how winds are blowing and distributing the ice. At its greatest extent, Arctic sea ice sprawled across 14.91 million km^2, which was 0.73 million km^2 below the 1981 to 2010 norm (chart from NSIDC).

This was the 5th smallest sea ice maximum in the 1978-2014 record.

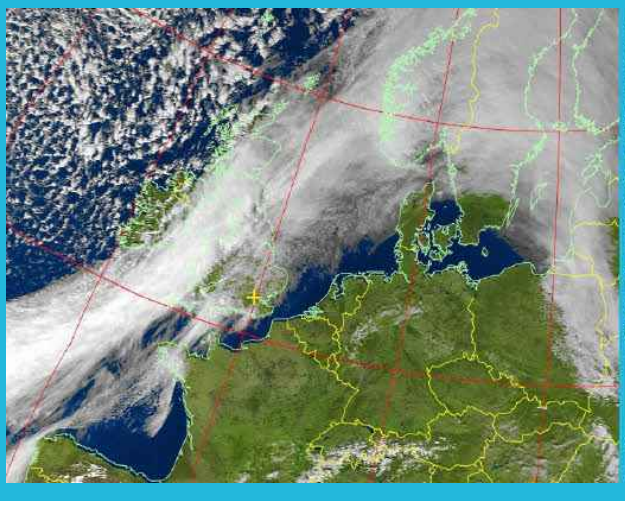
According to NSIDC: *"unusually low sea level pressure in the eastern Arctic and the northern North Atlantic. The pattern of surface winds helped to spread out the ice pack in the Barents Sea where the ice cover had been anomalously low all winter. Northeasterly winds also helped push the ice pack southwards in the Bering Sea, another site of persistently low extent earlier in the 2013 to 2014 Arctic winter. Air temperatures however remained unusually high throughout the Arctic during the second half of March, at 2 to 6 degrees Celsius (4 to 11 degrees Fahrenheit) above the 1981 to 2010 average."*

Thanks to weather systems, Antarctic sea ice is expanding despite global warming.

Meanwhile, around Antarctica (chart from CSP) where it has been summer, sea ice shrank to its minimum extent for the year on February 23. As reported by J. C. Comiso and co-workers (Cryosphere Science Research Portal): *"In the Antarctic, the trend is opposite to that in the Arctic, with the sea ice cover increasing at about 1 to 2 % per decade This is despite unusual warming in the Antarctic Peninsula region and declines in the sea ice cover in the Amundsen/Bellingshausen Seas of about 6% per decade."*



The spring equinox. Below left: The NOAA-19 satellite imaged a swathe of cloud across the British Isles at 12:43 GMT on March 20, 2014 (courtesy Geoff Hamilton), but the Sun broke through over southern England. Below right: The Sun behind horse chestnut buds. Safety note: photographer did not look directly at Sun.



Darkness falls over Antarctica, 2014.

As the Sun rose at the North Pole, it set at the South Pole. A NOAA webcam at the Amundsen-Scott South Pole Station recorded the gathering gloom as the polar night descended after the equinox. Left, from top to bottom: The final rays of the Sun on equinox day, March 20, 2014. March 22, March 29, April 10.

Global warming – greenhouse gases continue to rise sharply.

On May 2, the USA's National Oceanic and Atmospheric Administration published its Annual Greenhouse Gas Index for 2013.

Greenhouse gases work by allowing through most of the short-wave radiation from the Sun, but trapping and re-emitting infra-red emitted by the ground. Five gases, CO_2, N_2O, CH_4, CFC-12 and CFC-11, released by human activity, produce 96% of the heating effect (radiative forcing). The AGGI compares radiative forcing to the standard year of 1990 and NOAA have been publishing it since 2004.

In 2013 the overall strength of the heating effect was a disturbing 1.34 times greater than in 1990. It had risen by about 0.74 watts m^{-2} and almost 80 % (about 0.59 watts m^{-2}) of this effect was due to CO_2. However, attempts to restrict CO_2 emissions

According to NOAA: "*In 2013, carbon dioxide concentrations for the first time in recorded history exceeded 400 parts per million(ppm) at Mauna Loa —considered a "global benchmark" monitoring site—in early May. This year, CO_2 exceeded 400 ppm at Mauna Loa in mid-March, two months earlier than last year. Concentrations at Mauna Loa have continued to top 400 ppm throughout much of April and are expected to stay at historic high levels through May and early June, dropping in early summer only as trees and plants in the Northern Hemisphere begin to take up CO_2 during the growing season.*"

During the last year alone, the heating effect has risen by 1.5%.

Seasons in South East England

March, 2014

Above: March 9, 2014. Blackthorn (*Prunus spinosa*) blossoms in Belair Park, London.

By March, the bout of coastal damage, floods, gales, transport disruption and power blackouts was over. Warmer, sunnier weather had arrived.

For the UK as a whole the mean temperature was 6.7ºC. This was 1.2ºC higher than the mean for the period 1980-2010. Showers and sunshine alternated during the first week of March and on March 5, the temperature rose to 14ºC in London.

High pressure conditions dominated from March 8 to March 17, ensuring weather that was dry and bright.

The Met Office reported that: "*Although there were spells of fine early spring weather, there were also incidences of dense fog during the month. This caused some travel disruption on roads, with a number of accidents reported across parts of the South West, particularly Somerset on 13th, and flights were delayed at airports across the country.*"

At Gravesend, Kent, South East England, the temperature rose to 20.5ºC on March 9. However, it was only in the final part of the month that we saw the UK's highest and lowest temperatures for March 2014. The minimum temp. (-6.8ºC) was felt on March 24 at Redesdale Camp (Northumberland), whilst the highest temp. (20.9ºC)was enjoyed on March 30, and recorded at St James's Park in the middle of London and at Santon Downham in Suffolk.

Left (top to bottom): Late in the afternoon, on the first day of March, the Sun sets behind the paws of a sphinx – one of the many that were created for Joseph Paxton's innovative cast iron and glass Crystal Palace. This building was constructed on the Sydenham hill top, South London, in 1854, to provide a permanent home for the Great Exhibition championed by Prince Albert and it was opened by Queen Victoria. The building burned down in 1936. As the Sun set on March 1, the shadowing clouds threw "*crepuscular rays*" across the sky. NASA captured this image of fog filling the English Channel on March 13.

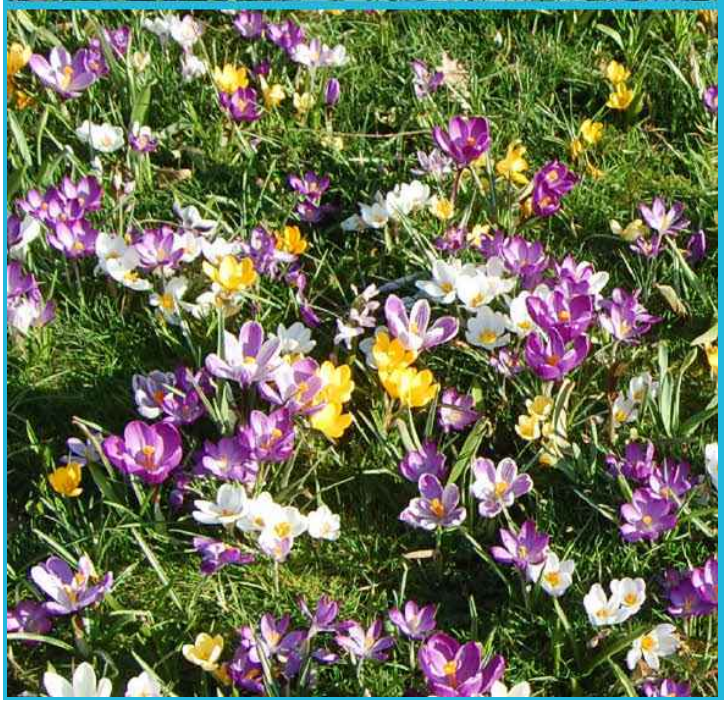
SE and central S England, mean max. temp.: 12.8ºC (2.3ºC); mean min. temp.: 3.4ºC (0.4ºC). Hours of sunshine: 162.3 (142%). Rain: 39.4 mm (142%). Anomalies re. 1981-2010 norm in brackets.

Source: online Met Office data.

During March, the woods and hedgerows of southern England were coming to life. The views at top and upper left were taken from Donkey Lane, Farningham, Kent on March 22.

Also on March 22, the tower of St Peter's and St Paul's church at Ash, Kent, rises above a hedgerow that a few weeks later would sport dense growths of cow parsley and purple flowered comfrey. On March 25, there was a seasonal service of tenebrae (shadows) in the chapel of King's College London. During the service, which leads up to Easter, candles are ceremonially extinguished, concluding with the choir's candles. The service is normally held during Holy Week, but KCL fits it in before the end of term.

Above: Gorse flowers on Dartford Heath, Kent, March 9. Below left: Snow falls at New Ash Green, Kent, March 25 (images: P. Stanford). Below right: Virga (precipitation that fails to reach the ground) NW Kent, March 15.



Left: Ornamental cherries and magnolia blossom on South London streets (Mar. 17); crocuses have flowered in Belair Park, South London (Mar. 9).

Global climate; March, 2014.

No records broken, but this March was amongst the warmest on record.

After a nondescript February, global temperatures were back near the top of the scale again. The combined average for land and sea surfaces on our planet was a notable 0.71 ± 0.09ºC above the 20th Century average of 12.3ºC, making it the 4th warmest March since 1880. The warmest were 2002 and 2010.

Globally, the surface of the land was 1.33 ± 0.22ºC warmer than the average - the 5th warmest March with 2008 as the warmest on record. It was also the 5th warmest for the ocean (0.48 ± 0.04ºC above the norm) with March 1998 and 2010 as joint warmest.

For the Northern Hemisphere the combined positive anomaly for land and ocean was 0.88 ± 0.16ºC above the norm, which made it the 5th warmest March on record with 2008 as the warmest. N. Hemisphere land areas were 1.59 ± 0.34ºC above the norm, the 4th warmest on record (2008 was hottest). As for the ocean, it was 0.45 ± 0.06ºC above the average, making it this the 5th warmest on record, with 2010 as warmest.

Meanwhile in the Southern Hemisphere, land and ocean together showed a temperature anomaly of 0.53 ± 0.08ºC above the mean, making it the 6th warmest March on record (1998 and 2010 were warmest). The ocean was 0.51 ± 0.04ºC above the mean, which made it the 5th warmest (warmest 1998), although the land, 0.66 ± 0.17ºC above the mean, saw merely the 17th warmest March in the records (warmest was 2010).

The report noted that: "*Each of the major oceans had large regions that were much warmer than average, and record warmth was observed in parts of the northeastern and equatorial Pacific, the eastern North and South Atlantic, and central Indian Oceans. While no areas were record cold, part of the central north Atlantic and the Southern Ocean off the tip of South America was much cooler than average during March.*"

Source: NOAA National Climatic Data Center, State of the Climate: Global Analysis for March, 2014, published online. Data provisional.

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