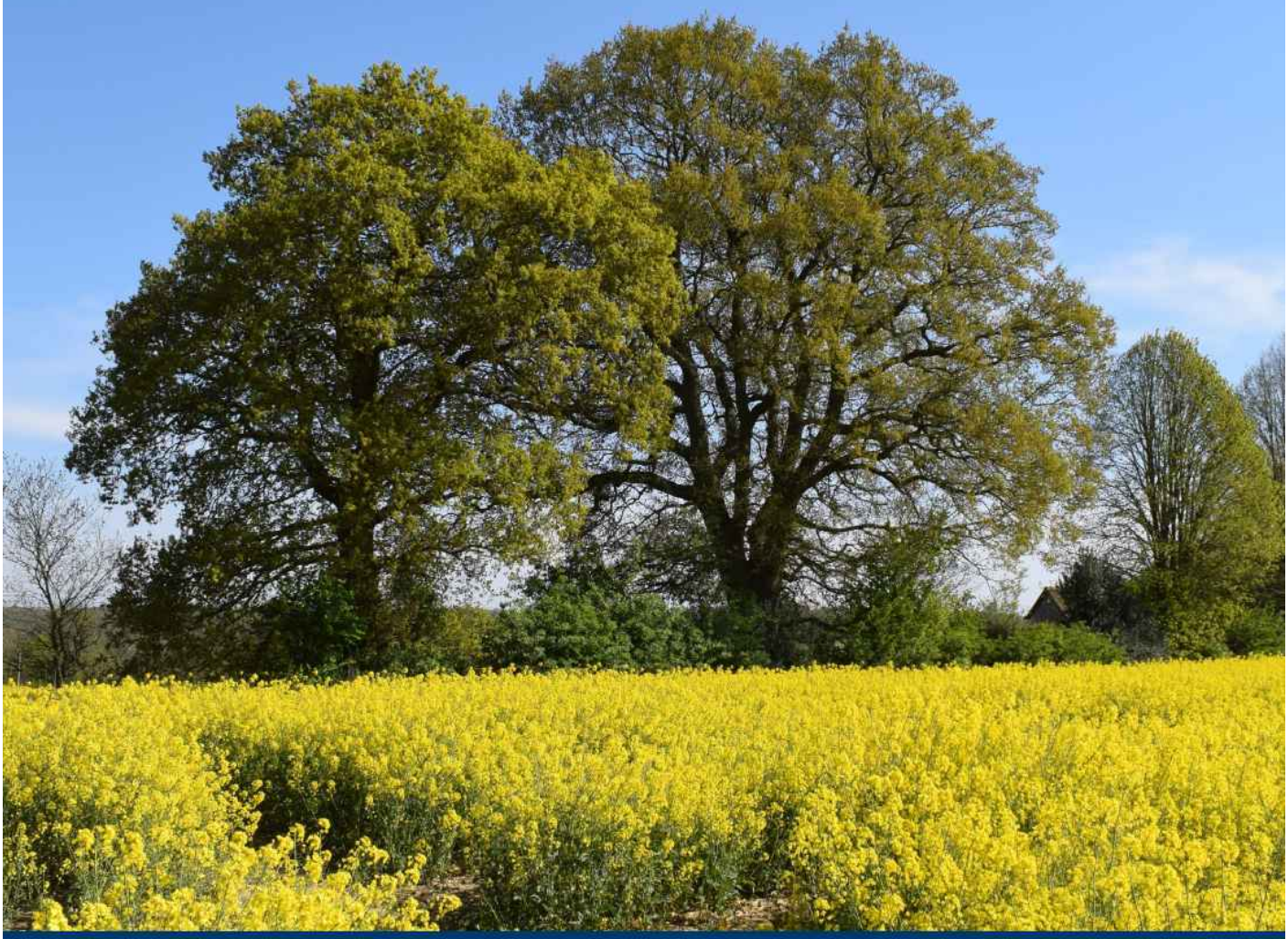
Prime Meridian (124) May 7, 2020



Above: April 21 2020 was yet another clear blue sky over South East England. The yellow flowers of oilseed had covered garish fields and oak trees in woods and hedgerows were coming into leaf. Those fortunate enough to live in the countryside were obliged, even so, to keep a distance from others in the lanes, woods and fields, to avoid SARS-CoV-2 transmission.

We look back on the climate in March, 2020.

We look also beyond the Earth.

During the last few months, we have seen beautiful views of our Moon and planet Venus in the evening sky. Recall also, however, that our throw-away civilisation has left its mark on other members of the Solar System. Earth's technosphere, created by human action, including much abandoned and non-recycled matter, has extended to other worlds. Out civilisation cannot yet re-cycle matter as effectively as biology.

The human techno-impact reaches far from Earth.

Looking out at the unfriendly Venus and our Moon, we must remind ourselves that the human impact has extended to these worlds and far beyond.

March: from cool, dark days through the equinox. After the spring equinox (March 20, this year) the days become longer than the nights. Also, the much debated practice of putting the hours forward in British Summer Time (March 29, this year), brings later times of daylight. There were great views of the Moon and Venus.

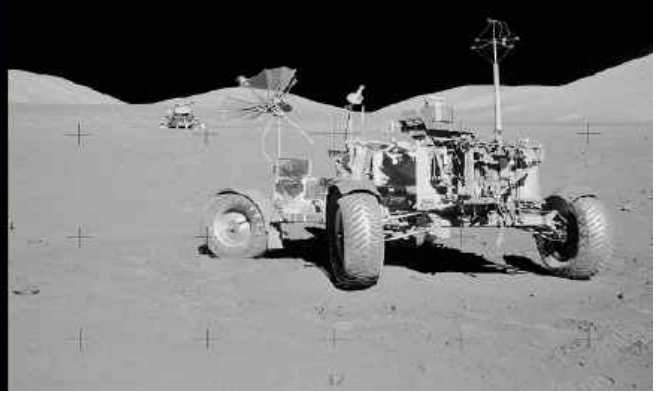
On March 27, 2020, (New Ash Green. Kent) the dawn was arriving in a cold sky among leafless trees. After sunset, a waxing Moon had crossed beneath Venus. Venus is about 95% the diameter of the Earth and not quite 82% its mass. Venus is close to the Sun and travels faster in its orbit. The surface roasts at 467°C beneath a massive atmosphere, mostly of CO_2, and is waterless and too hot for life-as-we-know-it. Some researchers, however, have suggested that some microbes known on Earth could, in principle, survive in clouds at 47.5-50.5 km altitude. Limaye, S. S, *Astrobiology,* 2018; DOI:10.1089/ast.2017.1783.

It is not enough just to think of a Climate Crisis. Human ingenuity has brought us immense benefits upon which we all now depend. At the same time, the impact of humans is undermining the natural world, which is the life support system for our existence. We talk about not just climate, but an Earth Crisis. One might also talk in terms of a human crisis or an ecosphere crisis. An ecosphere is a planetary scale ecosystem. The sphere of human impact is no longer Earth-bounded, but Earth centred.

At left, we see a turtle in a so-called "ghost net," an abandoned fishing line. Public domain. NOAA. The wreck of the SS *American Star* on the shore at Furteventura, Canaries. July 2, 2014. Wollex: GNU Free Documentation Licenes. The bow of the RMS Titanic, losts famously in 1912. Image on June 2004 by the ROV Hercules expedition. Public domain. Courtesy of NOAA/Institute for Exploration/University of Rhode Island (NOAA/IFE/URI).

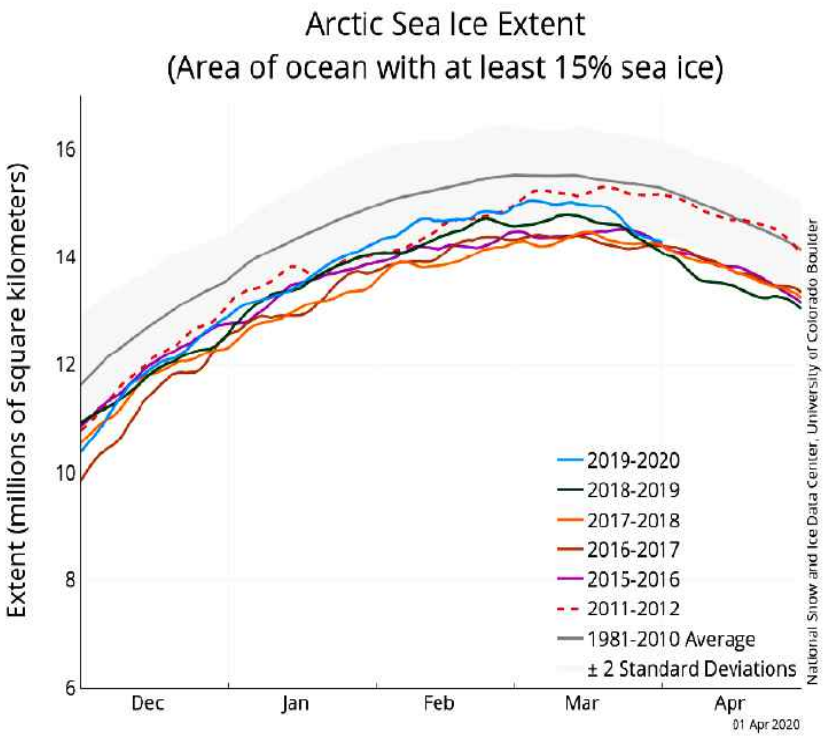
Top: Sections of the (now) abandoned Soviet Venera 13 lander at 7.5° S, 303°E in March 1982. Public domain. NASA.

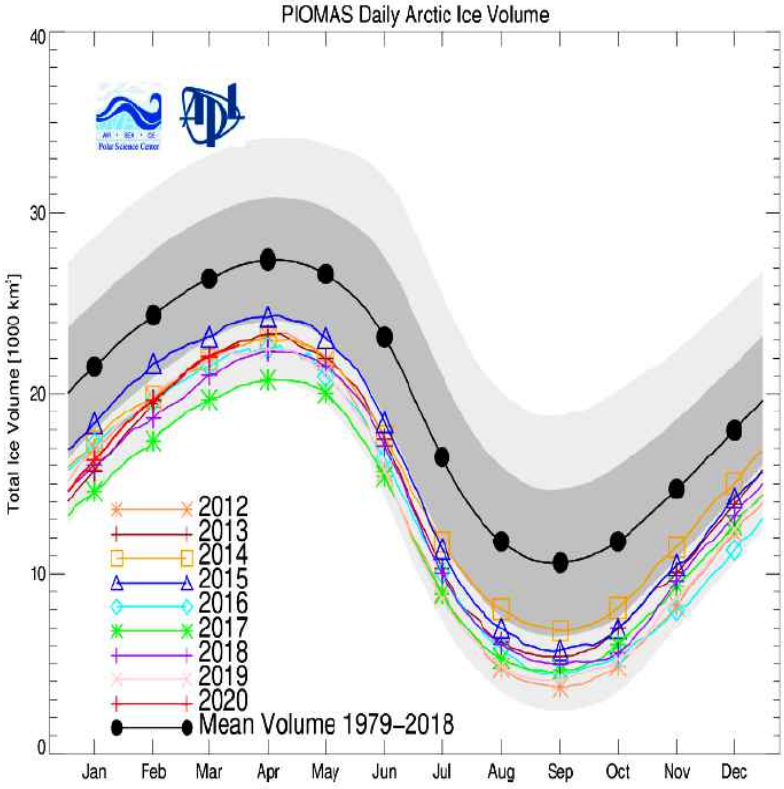
Below: Apollo 17 LEM in background and nearby Moon rover. December 1972. Public domain. NASA.



March 5, 2020 saw the Arctic sea ice reach its maximum extent for the year.

Around the date of the spring equinox, the Arctic sea ice reaches its maximum annual expansion and begins to retreat. The long-term trend has been for sea ice to dwindle away and by the second half of this century (we cannot be certain exactly when) it may disappear completely during the summer months. This March, however, neither the Arctic Sea Ice Extent nor ice volume set record lows.





According to the USA's National Snow and Ice Data Center (NSIDC): "On March 5, 2020, Arctic sea ice likely reached its maximum extent for the year, at 15.05 million square kilometers . . . , the eleventh lowest in the 42-year satellite record."

Left: The extent of sea ice from 2019 to 2020 (blue) is far from the lowest seen during the satellite record. We cannot predict what is likely to happen during this summer. As temperatures fall, September sees the year's minimum extent. This is around the autumnal equinox, which sees the extent stop shrinking and begins to grow again.

The smallest size of the extent seen so far, was in 2012, when, on September 16, its minimum was 3.41 million square kilometers. In March and April 2012, however, the extent of sea ice was close to the 1981-2010 norm . We must have wait and discover what happens during summer 2020.

The USA's Polar Science Center calculates sea ice *volume* using the Pan-Arctic Ice Ocean Modeling and Assimilation System, or PIOMAS: "Average Arctic sea ice volume in March 2020 was 22,700 km^3. This value is 2100 km^3 above the record minimum value of 20,600 km^3 set in 2017, making it the sixth lowest on record."

Seasons in South East England

March 2020

Our region was both the sunniest and the warmest in the UK.

The Met Office announced that: "The provisional UK mean temperature was 5.6°C, which is 0.1°C above the 1981-2010 long-term average." In England, the mean was 6.4°C (0.2°C above the mean), and our Met Office region of SE & Central S, had a mean temperature of 7.0°C (0.3°C).

The UK's coolest temperature (-7.6°C at Aboyne, Aberdeenshire, Scotland, March 16) and warmest temperature (19.4°C was recorded at Rhyl, Clwyd, Wales; March 24) lay far outside of our region.

Above and left: Spring leaves were appearing on the woodland floor and in some trees. Gabrielspring Wood, near West Kingsdown. The wild flowers known as lords-and-ladies (among other names) possess spots or maculations (not seen in all variants) that give their name as *Arum maculatum*. Also, new leaves of bluebells (*Hyacinthoides non-scripta*) have struggled up through the piles of last year's leaves.
March 12, 2020.

Above: Red clouds shortly before dawn on March 16, 2020. New Ash Green, Kent.

Right: The Moon was headed towards Full Moon on the evening of March 8. Full Moon took place on March 9 at 17:47 UTC.

Below: March 23, 2020. As dawn was approaching, the three planets which seen above the trees were Jupiter (brightest to the right), Mars, the dimmest to the left and low and Saturn, further left, above an ivy covered tree.

Monthly means for SE and central S England. Max. temp.: 10.9°C (0.4°C); min. temp.: 3.2°C (0.2°C). Hours of sunshine: 1725 (151%). Rain: 50 mm (87%). Anomalies re. 1981-2010 norm in brackets. Date obtained from Met Office on-line monthly reports.

https://www.metoffice.gov.uk/research/climate/maps-and-data/regional-values

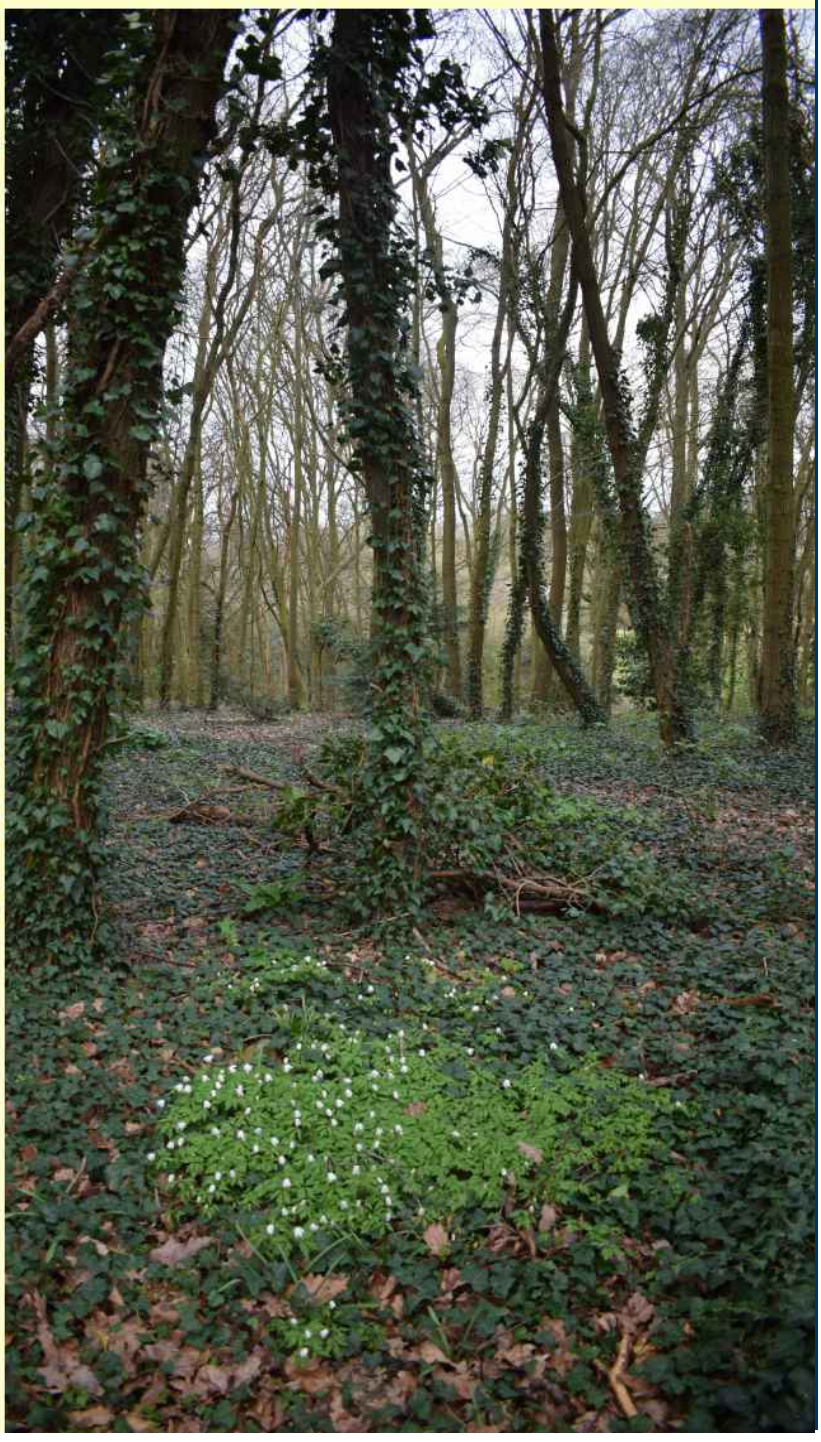
Top: familiar spring flower, *Primula vulgaris*, near the woodlands on the hill close to in Hartley, Kent. March 14, 2020.

Above left: The Sun appeared through clouds and leafless trees soon after noon on March 20, the day of the (Northern Hemisphere's) Spring Equinox.

Above centre and right: Wood anemone (*Anemone nemorosa*) in a former coppice at Ash, Kent. This species exploits the sunshine in the woods before the leaves of the trees have emerged.

Above right: The Sun beamed down on the coppice floor. March 24, 2020.

It was a clear blue sky on March 24 and greenery was emerging from the hedgerows along fields and lanes near St Peter's and St Paul's Church, Ash, Kent. The white flowers are blackthorn (*Prunus spinosa*).



Top: A low rainbow behind the trees on the afternoon of March 24. New Ash Green.

Above: Nesting carrion crow or jackdow in trees at New Ash Green, Kent. March 31, 2020.

Right: Wood anemone (*Anemone nemorosa*) in a wood above Hartley, Kent. March 14, 2020.

Above: **Wood anemone** (*Anemone nemorosa*) had emerged in a former coppice at Ash, Kent. March 24, 2020.

Global climate: March 2020 was the world's second warmest March on record.

The record began in 1880. Data from the USA's National Oceanic and Atmospheric Administration indicate that although "Averaged as a whole, the global land and ocean surface temperature for March 2020 was 1.16ºC . . . above the 20th century average of 12.7ºC . . . and the second highest in the 141-year record. Only March 2016 was warmer at 1.31ºC . . .. The 10 warmest March have all occurred since 1990, with Marches of 2016, 2017, 2019, and 2020 having a global land and ocean surface temperature departure from average above 1.0ºC . . .. "

Data is provisional. All the anomalies quoted are positive.

Check out NOAA data on:

https://www.ncdc.noaa.gov/sotc/global/202003

Above: A view of our planet obtained by the NASA/NOAA Deep Space Climate Observatory space craft on March 20, 2020, the day of the Northern Hemisphere's Spring Equinox. 11:43:31 GMT.

Above: The leaves of bluebells (*Hyacinthoides non-scripta*) in the woods around Gabrielspring Road, near West Kingsdown, Kent. March 21, 2020.

Prime Meridian.

PM is published by the Ecospheres Project, a research and media collaboration. PM follows global environment alongside the cycle of the seasons in South East England. It steps back to look at the Earth in its astronomical context and it pursues the search for other habitable worlds.

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