

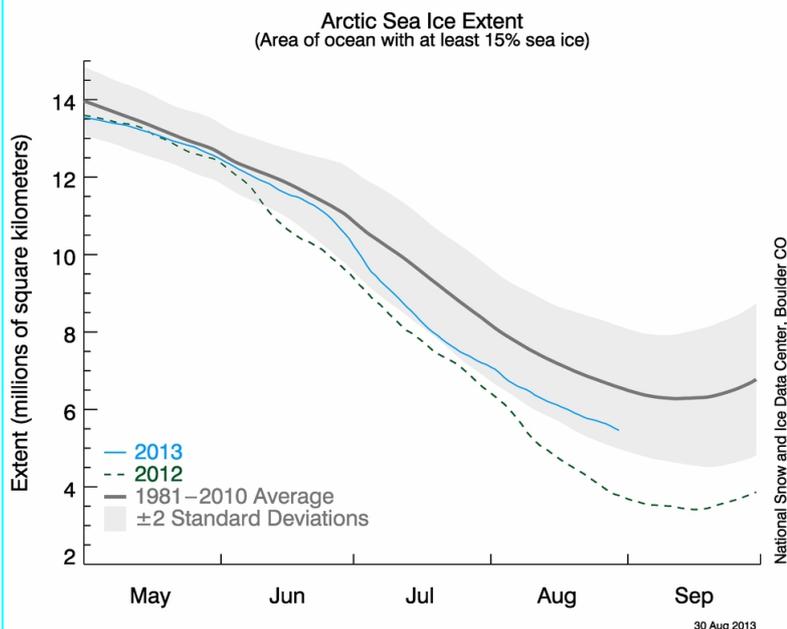
Prime Meridian

(16) August 31, 2013



A newsletter following the cycle of the seasons around Greenwich, England and global environmental change. Prime Meridian is published as part the outreach programme of the Ecospheres Project.

In southern England, we have been enjoying warm weather interspersed with bouts of rain welcomed by gardeners. Above we see a well-known member of our fauna, the speckled wood butterfly (*Pararge aegeria*), exploiting a glade in a specially created wildlife area in Belair Park, South London (August 29). In the 1920's the species appears to have emerged from a long decline and has become much more common. Alone of British butterflies it can overwinter in either the chrysalis or caterpillar stage, so that in southern areas, there may be three overlapping broods between the end of March until mid-October (see British Trust for Ornithology website).



Arctic sea ice approaches its minimum for 2013.

Looking northwards, concern continues to focus on the shrinking Arctic sea ice, whose disappearance might become a tipping point for climate change.

July saw stories flying around the internet that the Arctic sea ice was disappearing. Fortunately, this was a false alarm caused by the appearance of a seasonal melt pond in front of a webcam on the floating sea ice (which had drifted down to around 85°N by that time). After a few days, the melt pond had drained away.

The cause of this alarm, however, was not purely imaginary. Last year saw the greatest retreat of Arctic sea ice in the satellite record (3.4 million km²), and some scientists expressed the opinion that within just a few years, we might see an Arctic that lost its sea ice during the summer. It re-forms during the long polar night, but thicker multi-year ice is dwindling and much thinner ice is becoming the norm.

As we approach the time for the 2013 seasonal minimum, it seems unlikely, despite the fact that the ice extent has been below the 1981-2010 average, that it will shrink quite so dramatically as it did in September 2012. This is because this year's weather patterns in the Arctic are not the same as last year's.



An update from the U.S.A.'s National Snow and Ice Data Center explained:

“The pattern of unusually low pressure centered near the pole in 2013 has helped to spread the ice out and is consistent with generally cool conditions over much of the Arctic Ocean, inhibiting melt. By contrast, in the summer of 2012, a broad region of unusually high pressure centered over Greenland, in combination with below average pressure centered over the East Siberian and Chukchi seas, led to winds over the Beaufort Sea with a more southerly component than is usually the case, leading to warm conditions. That high pressure last year over Greenland also contributed to a record melt season for the Greenland ice sheet. Melt this year over the ice sheet has been more moderate, though still above rates seen in the 1990s.”

Nature editorial responds to climate sceptics.

It is hard to avoid the predictions of physics that as human activity continues to pump greenhouse gases into the atmosphere, there will be an overall warming trend (even if the temperature fluctuates from year to year and decade to decade due to effects in the complex systems controlling Earth's climate. However, whilst annual global temperatures for the 21st Century remain consistently amongst the highest recorded, they appear to be marking time and not shooting upwards. An editorial in the science journal *Nature* for August 29, 2013 remarked (p. 501): *“Although a prolonged hiatus in warming does not necessarily contradict prevailing theory, this one came as a surprise and has been used to discredit the climate-science community.”* Explanations of the hiatus being investigated include a prolonged phase of cooler conditions in the eastern equatorial Pacific, a lengthy minimum in solar activity, and aerosols released by human activity and volcanoes reflecting the Sun's energy into space. At the same time, the climate may be less sensitive to greenhouse gases than has been thought.

Studies suggest that Arctic cyclones may be growing more intense (climate scientists are debating exactly how intense), but the number of cyclones appears to be staying the same. It is possible that storms will become more energetic as the sea ice disappears, helping the process on its way. Morello, L. (2013). *Nature* 500: 512.

Left: View across Kent countryside near West Kingsdown, August 30, 2013.

Safety note: the photographer did not look the Sun through the lens.
Images: M. J. Heath unless stated otherwise.

