

## Briefing on the state of the Arctic sea ice

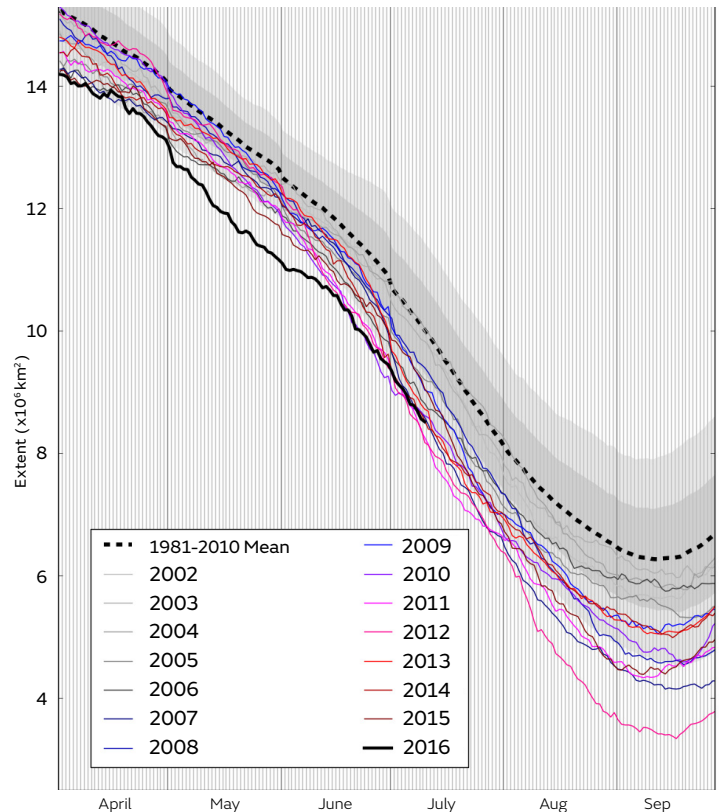
# Current Arctic sea ice extent

Arctic sea ice extent on 9 July 2016 was 8.51 million square km (Figure 1), according to data from the US National Snow and Ice Data Center\* (NSIDC).

**Extent was 1.64 million square km below the 1981-2010 average for this date and 0.34 million square km above the record low for the time of year, which occurred in 2012.**

Extent is currently particularly low in the Kara Sea north of western Siberia, and the Barents Sea north of Norway (Figure 2).

The conditions are likely to be associated with a ridge of high pressure over western Siberia during June, with associated transport of warm air across the Barents and Kara seas during this month. Other areas of the Arctic tended to see cooler conditions.



▲ Figure 1: Daily Arctic sea ice extent for 2016, compared with recent years, and the 1981-2010 average with  $\pm 1$  and  $\pm 2$  standard deviation intervals indicated by the shaded areas. Data is from the National Snow and Ice Data Center (NSIDC)

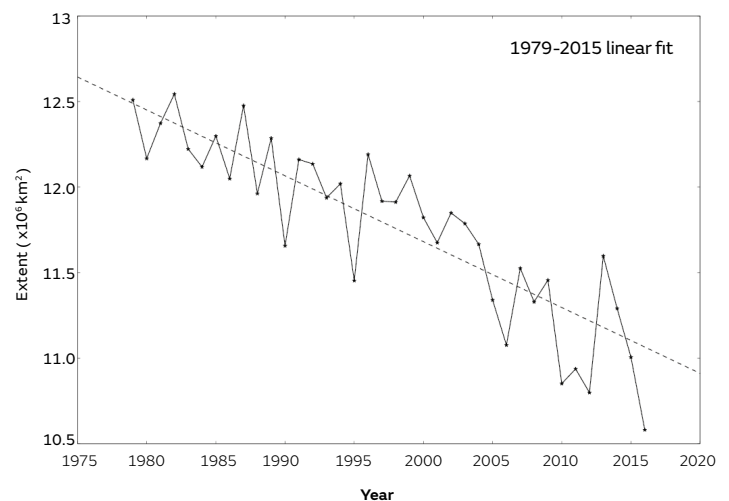
◀ Figure 2: Sea ice extent on 9 July 2016, with 1981-2010 extent for this date indicated in orange. Underlying map and data courtesy of NSIDC.

## June 2016 in context

**The average June Arctic sea ice extent was 10.58 million square km – the lowest June extent recorded in the series since satellite records began in 1979.**

This June's extent was 1.29 million square km below the 1981-2010 average and 0.48 million square km below the 1979-2015 linear trend (Figure 3).

The average rate of ice extent loss for June was 56,900 square km per day, slightly above the 1981-2010 average of 53,600 square km per day.



▲ Figure 3: June average Arctic sea ice extent according to the Hadley Centre Sea Ice and Sea Surface Temperature (HadISST) 1.2 dataset (Rayner et al, 2013)

# Outlook for September 2016

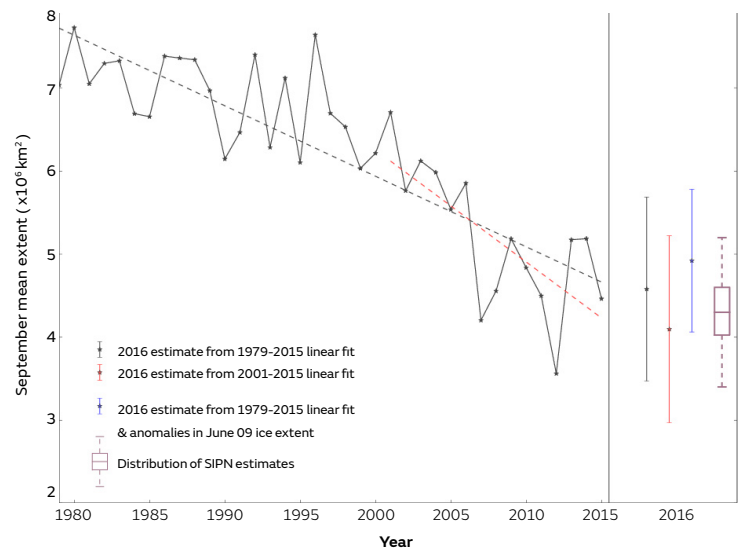
A number of projections of this year's seasonal minimum (September) ice extent are displayed in Figure 4, and described below:

- The mean September extent outlook from the Sea Ice Prediction Network (SIPN), which includes 30 predictions based on a variety of methods from centres around the world, predicts a range from 3.4 to 5.2 million square km. The median estimate is 4.28 million square km. The median, inter-quartile range and max/min predictions are shown on the right-hand-side of Figure 4.
- Other statistical predictions based on an extrapolation of the linear trend for the entire satellite period from 1979-2015 (black) and over the most recent 15 years (red) suggest a mean September sea ice extent of 4.58 ( $\pm 1.11$ ) and 4.10 ( $\pm 1.13$ ) million square km respectively.
- There is a reasonable correlation between mean September ice extent and the extent for 24 June – 9 July (for which 15 days of data were available at the time of writing). Applying simple statistical methods to the anomalies for these dates gives a prediction of September mean extent of 4.92 ( $\pm 0.86$ ) million square km.

**While the range of outlooks above may suggest this year is relatively unlikely to go below the record low minimum extent of 3.6 million square km, set in 2012, there is a high level of uncertainty in projections at this stage of the melt season.**

Figure 4: September median Arctic sea ice extent since satellite records began in 1979 from the HadISST1.2 dataset (Rayner et al., 2013). September 2016 predictions from the SIPN Sea Ice Outlook predictions and statistical estimates are included.

For the statistical estimates, error bars represent twice the standard deviation of September mean ice extent about the trend lines with respect to which the estimates are taken. The Sea Ice Outlook is shown as a boxplot indicating range, median and quartiles of the 30 estimates submitted.



Rayner, N. A.; Parker, D. E.; Horton, E. B.; Folland, C. K.; Alexander, L. V.; Rowell, D. P.; Kent, E. C.; Kaplan, A. (2003) Global analyses of sea surface temperature, sea ice, and night marine air temperature since the late nineteenth century J. Geophys. Res. Vol. 108, No. D14, 4407 10.1029/2002JD002670

\*Data from the Japanese Meteorological Agency (JAXA) was used in the previous Met Office Arctic sea ice briefing due to temporary suspension of NSIDC updates due to failure of a satellite sensor. Following the [successful resolution](#) of this issue, this and all future briefings revert to using NSIDC data.