Nature's Calendar

Spring analysis 2023

Judith Garforth

Summary

2023 was a warm spring, with temperatures above average each month. Although not record breaking, the consistently high temperatures from January to June resulted in most spring events being early. The most popular seasonal change to record was snowdrop first flowering, which is also one of the earliest signs of spring.

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Temperature

- Spring 2023 was warm compared to the 30-year average (1961-90).
- Average monthly temperatures from January to June 2023 were 0.8°C to 2.9°C greater than the 30-year average.
- February and June were particularly warm compared to the 30-year average. June 2023 was the warmest June in the CET dataset since 1846.

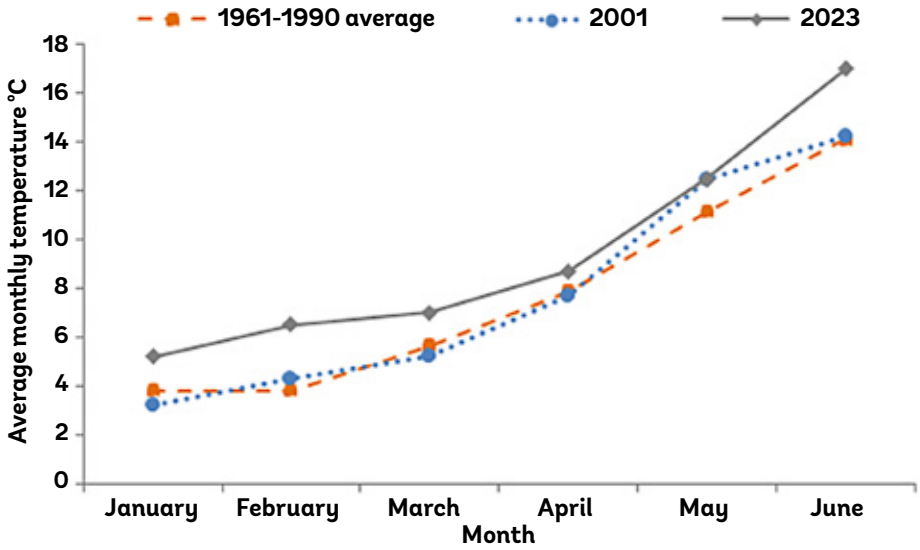


Figure 1: Average monthly temperatures 2023 (Central England Temperature*[1]) compared with 30-year average (1961-90) and 2001 benchmark** year.

Rainfall

- Monthly rainfall totals in February, May and June were noticeably lower than the 30-year average. February had the lowest monthly total since 1993.
- Monthly rainfall totals in January and March were above the 30-year average. The first half of January was particularly wet, and it was the sixth wettest March in the dataset, which dates back to 1836.
- The monthly rainfall total in April was very similar to the 30-year average.

* The Central England Temperature (CET) dataset is a record from a roughly triangular area of the UK, enclosed by Bristol, Lancashire and London.

** 2001 is used as a benchmark year because the mean monthly temperatures in spring were similar to the 30-year average (1961-90) temperatures.

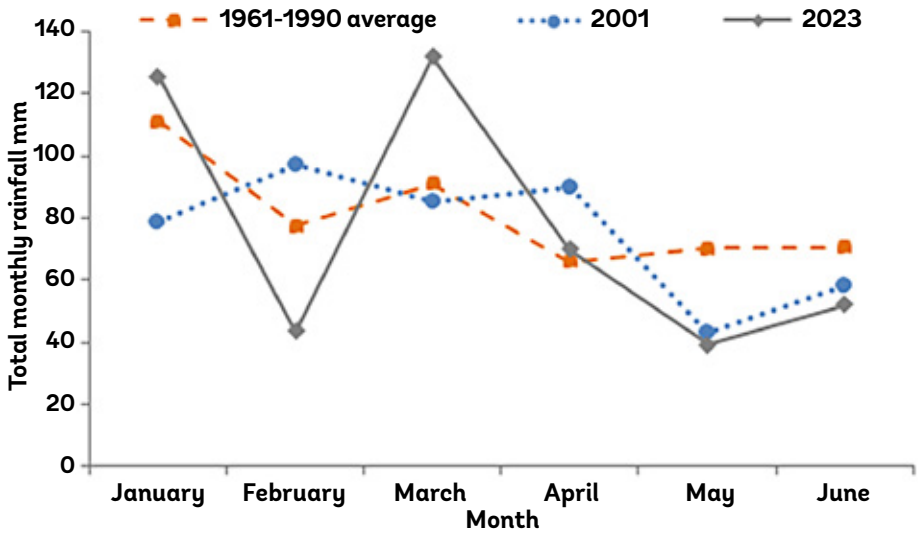


Figure 2: Monthly rainfall totals 2023 (HadUK-Grid[2]) compared with 30-year average (1961-90) and 2001 benchmark** year.

Nature's Calendar Records

There are 94 different seasonal events that can be recorded for the Nature's Calendar project in spring.

During 2023, our volunteers recorded a staggering 16,860 observations, monitoring signs of spring across the UK, from Shetland in the north to Cornwall in the south.

For each species and event, all the records are combined and a UK average date is calculated. These average dates are compared to the average dates in the benchmark year of 2001**.

Overleaf we take a look at some of the most popular species and events recorded this spring.

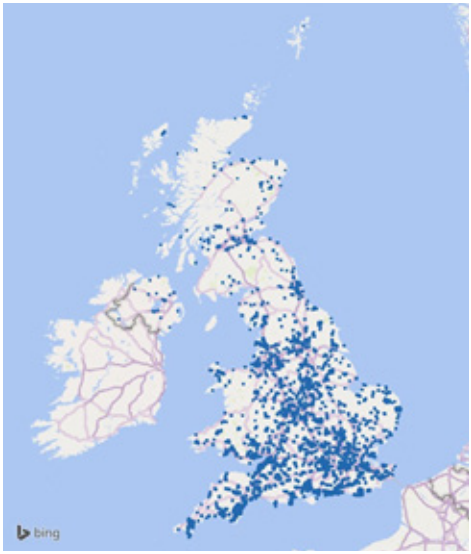


Figure 3: Records submitted to the Nature's Calendar website during spring 2023. Record distribution generally matches local human population density, a common feature of volunteer recording projects.

Migrant birds

- Swallows and swifts were the most popular migrant birds recorded this spring. The return of migrating swallows was also the eighth most popular event to be recorded overall.
- Swallows arrived four days earlier (21 April), and swifts two days later (12 May) than during the benchmark year.

Swallow and swift John Bridges/WTML

- Several of the migrant birds that can be recorded for Nature's Calendar are now listed in the Birds of Conservation Concern report[3] (also known as the UK Red List). Their population numbers are decreasing in the UK and therefore our volunteers are less likely to spot and record their arrival in the UK after winter migration. We received less than 20 records of turtle dove, spotted flycatcher and nightingale this spring.

Nesting birds

- Nesting of blackbird (26 March), blue tit (29 March), great tit (5 April) and rook (1 March) were recorded 2-11 days earlier this spring than in the benchmark year, most likely due to the above average temperatures.

Blue tits Kim Taylor/Naturepl.com

- Consequently, feeding of young was also recorded 2-5 days earlier than during the benchmark year.

Insects

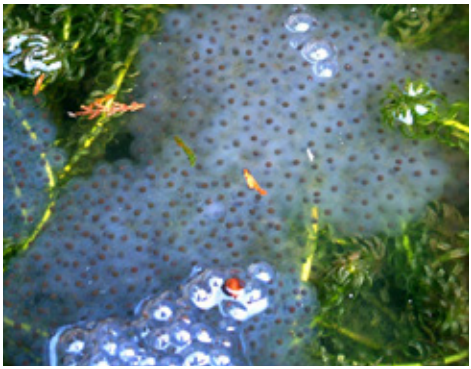
- Brimstone butterfly was the most popular insect recorded this spring. Brimstone first recorded was also the fifth most popular event overall, despite brimstone only being commonly found in England and Wales (the species is less common in Ireland and rare in Scotland).

Brimstone Libby Owen/WTML

- Brimstone butterflies are first spotted early in spring, when adults emerge from hibernation. Warm temperatures in February and March resulted in an average first recorded date of 30 March, 10 days earlier than during the benchmark year.

- Orange tip butterfly has a much wider UK distribution. Orange tip first recorded was the sixth most popular event overall. It's one of the species we use to calculate the Spring Index (more on this below).
- This species doesn't overwinter as an adult, so appears slightly later in the year compared to brimstone. The average first recorded date was 27 April, which was 12 days earlier than during the benchmark year.

Amphibians



Frogspawn Margaret Barton/WTML

- The first appearance of frogspawn is a classic sign of spring, and the second most recorded event overall. This spring, the average date was 2 March, which is 10 days earlier than during the benchmark year. The very first sightings were recorded in January. Sometimes we receive records of frogspawn as early as December, but the temperature in December 2022 was below average; the coldest since 2010.

Flowers

- Nature's Calendar volunteers seem to particularly enjoy recording flowers in spring. Snowdrop first flowering was the most popular event overall, likely due to it also being one of the earliest signs of spring (25 January). Only hazel first flowering was earlier (22 January). Lesser celandine and bluebell first flowering were also in the top five most recorded events.
- Snowdrop, lesser celandine (3 March) and bluebell (14 April) first flowering were 11-12 days earlier than during the benchmark year. Similarly, the flowering of species that occur later in the spring such as hawthorn (1 May) and oxeye daisy (17 May) were also earlier than during the benchmark year, most likely due to the consistently higher than average temperatures from January to June.
- We received reports of particularly spectacular hawthorn blooms this spring and look forward to discovering if these result in high haw fruit scores later in the year, especially as May and June were relatively dry and therefore good for pollinators on the wing.

Hawthorn John Bridges/WTML

Horse chestnut Rosanna Ballentine/WTML

Trees

- Hawthorn was the most recorded tree species. The average dates of budburst (12 March) and first leaf (20 March) were just over a week apart, and both just under a fortnight earlier than during the benchmark year. The popularity of this species is probably due to its widespread distribution, in hedgerows, woodland and scrub in urban and rural areas. It's one of the first trees to turn our hedgerows green in spring.
- Also popular was horse chestnut. With sizable brown sticky buds that burst to reveal large, bright green palmate leaves, it's hard to miss this sign of spring. There was over a week between average dates of budburst (12 March) and first leaf (6 April), and both were earlier (by 6 and 9 days) than during the benchmark year.

Project news

State of the UK Climate 2022

Nature's Calendar data was used in the phenology section of the State of the UK Climate 2022 report[4], published in spring 2023 by the Royal Meteorological Society. The report included an analysis of four woody plant species, four flower species, four invertebrate species and four vertebrate species. These indicators were early by 1–10 days compared to the 1999–2020/2021 baseline, for all species except swallow. Overall, the 2022 leaf-on season was 7–16 days longer than the 1999–2021 baseline because of the extended seasons in both spring and autumn.

naturescalendar.woodlandtrust.org.uk/analysis/research-reports

25 years of the Spring Index

Incredibly, this year we contributed ***25 years*** of Nature's Calendar data for the calculation of the Spring Index[5].

The Spring Index is one of the Joint Nature Conservation Committee (JNCC) UK Biodiversity Indicators. These indicators are used to report on progress towards meeting the international goals and targets set out in the Strategic Plan for Biodiversity.

The Spring Index (calculated from hawthorn flowering, horse chestnut flowering, orange tip butterfly

emergence and swallow arrival dates) shows high year-to-year variability as the weather fluctuates.

However, the difference between the average index for the 1891-1947 period (calculated from data taken from the Royal Meteorological Society recording scheme) and the 1998-2022 period (calculated from Nature's Calendar data) is 8.7 days. This illustrates spring moving more than a week earlier. **naturescalendar.woodlandtrust.org.uk/analysis/research-reports**

Autumn webinar

In August, we hosted our first autumn webinar entitled 'Is Climate Change Altering Autumn?'. The webinar explored background information about the project, what to record in autumn, autumn recording tips, a summary of last autumn's findings and examples of who uses the data, as well as a discussion of how climate change is altering autumn by guest speaker Professor Tim Sparks. This webinar was recorded and is available to watch at **naturescalendar.woodlandtrust.org.uk/blog**.

Thank you

Thank you so much for continuing to record your local seasonal changes for the Nature's Calendar project. We couldn't do any of the research we've mentioned above without your help.

We're always on the lookout for more volunteers to take part in the project. Anyone can sign up and find out more at naturescalendar.woodlandtrust.org.uk.

References

[1]Parker, D.E., Legg, T.P. and Folland, C.K. (1992) A new daily Central England Temperature Series, 1772-1991. International Journal of Climatology, 12, 317-342.

[2]Hollis, D., McCarthy, M., Kendon, M., Legg, T. and Simpson, I. (2018) HadUK-Grid gridded and regional average climate observations for the UK. Centre for Environmental Data Analysis.

[3]Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, Al, Lindley, P., McCulloch, N., Noble, D.G. and Win, I. (2021) Birds of Conservation Concern 5. British Birds, 114.

[4]Kendon et al. (2023) State of the UK Climate 2022. International Journal of Climatology. Special Issue Article.

[5]JNCC (2023). UK Biodiversity Indicators. jncc.gov.uk/our-work/uk-biodiversity-indicators-2022

Orange tip John Bridges/WTML

Thank you so much for your continued support.
We hugely appreciate all the time and effort
you put into recording.

Anyone can sign up and find out more at
naturescalendar.woodlandtrust.org.uk.

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