An Phríomh-Oifig Staidrimh
Central Statistics Office

Standard SIMS Report:

Plant Phenology

Single Integrated Metadata Structure (SIMS) Report

For

Plant Phenology

This documentation applies to the reporting period:
2020

Last edited: 7th October, 2021

1. Table of Contents

2. Introduction

Phenology is the study of seasonal changes in plants and animals from year to year, such as the flowering of plants, the emergence of insects and migration of birds.

Phenology has been principally concerned with the dates of first occurrence of biological events in their annual cycle. Examples include the date of emergence of leaves and flowers, the first flight of butterflies, the first appearance of migratory birds, the date of leaf colouring and leaf fall in deciduous trees, the dates of egg-laying of birds, etc. Because many such phenomena are very sensitive to small variations in climate, phenological records can be a useful proxy for temperature in historical climatology, especially in the study of climate change. Changes in timing affect ecosystem functioning.

Plant phenology has been proposed as an indicator of climate change by the European Environmental Agency and the Intergovernmental Panel on Climate Change. Changes in the timing of phenological events may influence biological processes and species distribution.

3. Contact

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4. Metadata Update

4.1. Metadata last certified

7th October, 2021.

4.2. Metadata last posted

12th October, 2021.

4.3. Metadata last update

7th October, 2021.

5. Statistical Presentation

5.1. Data Description

Plant Phenology is a release which provides statistics and characteristic information on the phenology of plant species in Irish phenological gardens. The statistics include dates of first occurrence of certain biological events in their annual cycle, for example, the beginning of leaf-unfolding, first fruit, leaf fall, etc.

5.2. Classification System

Plant species, phenophase stage, and phenophase date.

5.3. Sector Coverage

Not applicable.

5.4. Statistical Concepts and definitions

Phenology has been principally concerned with the dates of first occurrence of biological events in their annual cycle. Examples include the date of emergence of leaves and flowers, the first flight of butterflies, the first appearance of migratory birds, the date of leaf colouring and leaf fall in deciduous trees, the dates of egg-laying of birds, etc.

Phenophases

Beginning of leaf unfolding (bud burst): This phase occurs when the first regular surfaces of leaves become visible in three to four places. This is when the first leaf of a plant has pushed out of the bud up to its leaf stalk.

May shoot: This is the first spring sprout of the conifers. The buds are open and the protective sheath comes off the bud edges. The needles have not yet expanded at this point.

Beginning of flowering: This is when the first regular flowers have opened in three to four places on the observed plant.

General flowering: This occurs when more than half of the blossoms are open.

St John's sprout: The first sprouts of oaks and mountain ashes are regularly followed by a second sprout, the St John's sprout. Buds that are already developed for the next year are caused to sprout prematurely by weather conditions. These second sprouts can be recognised by their fresh colour. The state of the first leaf unfolding is repeated: the first leaves of the sprout have their typical forms but not yet the final size of the fully developed leaves.

First ripe fruits: This phase is observed when the first fruits have ripened in several places (about three or four) on the observed plant.

Autumn colouring: More than half of the leaves of the observed plant have changed their colour, including those leaves which have fallen in large quantities.

Leaf fall: This is recorded when more than half of the leaves of the observed plant have fallen.

Length of the Phenology Season: The number of days between the beginning of leaf unfolding and leaf fall dates has been used in some graphs as an approximation for the length of the growing season.

5.5. Statistical Unit

In this report, an observation is defined as a single date for one phenological stage for one tree at one location. In some cases, multiple dates were available for the same event e.g. where a plant was cloned at the same garden. If the observer had combined the cloned observations into a single date for the phenophase then that was used.

5.6. Statistical Population

Specific plants in phenological gardens in Ireland.

5.7. Reference Area

Ireland.

5.8. Time Coverage

1966-2020.

5.9. Base period

Not applicable.

6. Unit of Measure

Number of days, day of year.

7. Reference Period

2020.

8. Institutional Mandate

8.1. Legal Acts and other agreements

Voluntary dissemination.

8.2. Data Sharing

Not applicable.

9. Confidentiality

9.1. Confidentiality – policy

All information supplied to the CSO is treated as strictly confidential. The Statistics Act, 1993 sets stringent confidentiality standards: Information collected may be used only for statistical purposes, and no details that might be related to an identifiable person or business undertaking may be divulged to any other government department or body. These national statistical confidentiality provisions are reinforced by the following EU legislation: Council Regulation (EC) No 223/2009 on European statistics for data collected for EU statistical purposes. Further details are outlined in the CSO's Code of Practice on Statistical Confidentiality.

For more information on the CSO confidentiality policy please visit:
https://www.cso.ie/en/aboutus/lgdp/csodatapolicies/statisticalconfidentiality/

9.2. Confidentiality – data treatment

Not applicable.

10. Release Policy

10.1. Release Calendar

The date of dissemination of all statistics released by CSO can be found in the Release Calendar published in CSO.ie. This calendar is regularly updated.

10.2. Release calendar access

The release calendar can be accessed via the CSO website, www.cso.ie, or directly from this link:
https://www.cso.ie/en/csolatestnews/releasecalendar/

10.3. User access

In accordance with Principle 6 of the European Statistics Code of Practice all users of CSO statistics have equal access via the CSO website at the same time of 11 am. Any privileged pre-release access to any outside user is limited, controlled and publicised. In the event that leaks occur, pre-release arrangements are revised so as to ensure impartiality.

The CSO recognises that in very limited circumstances a business need for pre-release access may be substantiated. Any form of pre-release access is a privilege and a strict CSO pre-release access policy is adhered to for these special requests. The full pre-release access policy can be accessed at
https://www.cso.ie/en/aboutus/lgdp/csodatapolicies/csopolicyonpre-releaseaccess/

The various results are published nationally in statistical release format as well as on the CSO website (www.cso.ie). Selected extracts from the results are posted on the CSO's data dissemination database, PxStat.

11. Frequency of Dissemination

Annual.

12. Accessibility and clarity

12.1.News release

Press Statement
https://www.epa.ie/publications/research/climate-change/climate-change-research-programme-report-number-23.php

https://www.cso.ie/en/csolatestnews/pressreleases/2021pressreleases/pressstatementplantphenology2020/

12.2. Publications

The CSO statistical release can be found directly from this link:
https://www.cso.ie/en/statistics/climateandenergy/plantphenology/

12.3. On-line database

The full time series of observations has been made available on the CSO PxStat database. Users should note that the series has not been smoothed to correct errors in the observation dates.

This database can be accessed directly from the link: https://data.cso.ie/product/PPY

The data is also publicly available through the PEP725 database
http://www.pep725.eu/data_download/data_selection.php

12.3.1. AC 1. Data tables -consultations

Table name	No. Consultations
PPY01	74
PPY02	44
PPY03	41
PPY04	45
PPY05	49
PPY06	33
Release	165
Infographic	9

12.4. Micro-data Access

Not applicable.

12.5. Other

2013 EPA report on Ireland's National Phenology Network, discussing the use of data on changes in phenological activity as an indicator of Ireland's changing climate

https://www.epa.ie/publications/research/climate-change/climate-change-research-programme-report-number-23.php

12.5.1. AC2. Metadata consultations

Not calculated.

12.6. Documentation on Methodology

Further information on the methodology used can be found in the methods page on CSO.ie or directly from this link: https://www.cso.ie/en/methods/climateandenergy/plantphenology/

12.6.1. AC3 – Metadata completeness – rate

Not calculated.

12.7. Quality Documentation

Further documentation on the quality of the disseminated information can be found in the methods page on CSO.ie or directly from this link: https://www.cso.ie/en/methods/climateandenergy/plantphenology/

13. Quality Management

13.1.Quality Assurance

Quality Management Framework
The CSO avails of an office wide Quality Management Framework (QMF). This framework allows all CSO processes and outputs to meet the required standard as set out in the European Statistics Code of Practice (ESCOP). The QMF foundations are based on establishing the UNECE's Generic Statistical Business Process Model (GSBPM) as the operating statistical production model to achieve a standardised approach to Quality Management. All and any changes implemented to CSO processes and outputs require adherence to the QMF.

We have discussed with the data providers whether it is possible to check data that look incorrect but in general the original record sheets are not available.

13.2. Quality Assessment

The data are of good quality but because of the wide variability in the climate from year to year, more observations would be needed from more gardens to make a full assessment of the data quality and climate-related changes.

14. Relevance

14.1. User Needs

Changes in the timing of a plant's annual cycle is a potential indicator of climate-change. Used by environment and climate statistics.

14.1.1. Main National Users

Government, policy-makers, environment sector, national media, general public.

14.1.2. Principal External Users

Not applicable.

14.2. User Satisfaction

Not measured.

14.3. Data Completeness

Not applicable.

14.3.1. Data Completeness rate

Not applicable.

15. Accuracy and reliability

15.1. Overall accuracy

Not measured.

15.2. Sampling Error

Not applicable.

15.2.1. A1.Sampling error indicator

Not applicable.

15.3. Non-sampling Error

Not applicable.

15.3.1. Coverage error

Not applicable.

15.3.1.1. A2. Over coverage rate

Not applicable.

15.3.1.2. A3. Common units – proportion

Not applicable.

15.3.2. Measurement error

Some dates may have been recorded incorrectly.

15.3.3. Non-Response Error

Many records are not complete for all annual phenophase stages. the amount of missing data varies widely by variable, by station and by year i.e. for example Johnstown Castle is missing all data from 2001 to 2010 inclusive, and for years intact there are still gaps for some phenophases for plants that are routinely recorded.

15.3.3.1. Unit non response rate

Not calculated.

15.3.3.2. Item non response rate

Not calculated.

15.3.4. Processing error

Errors may have occurred as data were transferred from work sheets to a standard reporting form etc.

15.3.5. Model assumption error

Not applicable.

16. Timeliness and punctuality

16.1. Timeliness

The target timeliness is within five months of the end of the reference year. If any missing data are located, they will be added to the following year's release.

16.1.1. TP1. Time lag – First results

Not applicable.

16.1.2. TP2. Time lag – Final results

5 months.

16.2. Punctuality

While deadlines are dependent on the availability of data, there have been no issues with delays, etc.

16.2.1. TP3. Punctuality – Punctuality - delivery and publication

The information was disseminated on time according to the release calendar.

17. Comparability

17.1.Comparability – Geographical

Changes in the location of the plant or in the vegetation surrounding the plant may cause discontinuities.

17.1.1. CC1. Asymmetry for mirror flow statistics

Not applicable.

17.2. Comparability over time

Data has been collected from 1966 to 2020.

17.2.1. Length of Comparable Time series

54 years.

17.3. Coherence – cross domain

Not applicable.

17.3.1. Coherence – Sub annual and annual statistics

Not applicable.

17.3.2. Coherence with National Accounts

Not applicable.

17.4. Coherence – internal

Not applicable.

18. Cost and Burden

Not applicable.

19. Data Revision

19.1.Data Revision Policy

Revisions refer to changes made to published statistical data when the information used in its production has been updated or corrected. This information includes all data used in compiling the statistic e.g. respondent data, administrative data, weights and factors, methodology, classifications, definitions, modifications to survey questionnaires, survey scope and data collection methods.

The data revision policy that CSO statistics adheres to can be found via the following link: https://www.cso.ie/en/methods/quality/treatmentofrevisions/

19.2. Data Revision Practice

The results are subject to revision. Some phenological events must precede other events. However, there are known errors in the microdata used for this report. These errors have not been corrected. It is hoped that it may be possible to recheck some of the data or to obtain access to the original data.

19.2.1. Data Revision – Average size

Not applicable.

20. Statistical processing

20.1. Source Data

The data sources used for the compilation of this output are received from Met Éireann and the National Botanic Gardens.

20.1.1. Population and sampling frame

Plant species found in Irish phenological gardens.

20.1.2. Sampling design

The plants being monitored were agreed as part of an international phenological data collection initiative.

20.1.3. Survey size

Around 7,300 observations.

20.1.4. Survey technique

File transfer from Met Éireann and the National Botanic Gardens.

20.2. Frequency of data collection

Annual

20.3. Data Collection

A standard form is used to record all data.

20.3.1. Type of Survey/Process

The data are collected by trained observers.

20.3.2. Questionnaire (including explanations)

A standard form is used to record all data, an example of a Phenological Observations Sheet can be found via this link;

https://www.cso.ie/en/media/csoie/releasespublications/documents/er/plantphenology/2020/IPG_ObsSheet.pdf

20.3.3. Survey Participation

Observations from six gardens have been included in this release.

20.3.4. Data Capture

Annual plant phenology data were obtained directly from Met Éireann and the National Botanic Gardens.

20.4. Data Validation

The CSO has checked the quality of the data it keyed into an integrated dataset against the original data sent to the CSO.
We have discussed with the data providers whether it is possible to check data that look incorrect but in general the original record sheets are not available. No corrections have been made for dates that appear to be incorrect.

20.5. Data Compilation

The earliest phenophase dates in the historical series were calculated by the CSO. Each variable is sorted by converting dates to 'Day number' (e.g. February 1st = Day 32). Therefore, the observation with the smallest day number is the earliest phenophase date.

20.5.1. Imputation (for Non-Response or Incomplete Data Sets)

Not applicable.

20.5.1.1. A7. Imputation rate

Not applicable.

20.5.2. Grossing and Weighting

Not applicable.

20.6. Adjustment

Not applicable.

20.6.1. Seasonal Adjustment

Not applicable.

21. Comment