

Wildlife Recording, phenology and monitoring climate change

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Outline

- Phenology
- History of phenology recording
- Evidence for Climate change

Definition

Phenology is the study of the times of recurring natural phenomena especially in relation to climate.

The word is derived from the Greek *phainomai* (φαινομαι - to appear, come into view) and indicates that phenology has been principally concerned with the dates of first occurrence of biological events in their annual cycle.

Activity

In groups, list 'phenological' activities for each season

Spring – Frog spawn, Lesser celandine flowering, birds mating/song, butterflies, leaf burst, swallows

Summer – Summer birds arrive eg warblers, summer butterflies

Autumn – Deer ruts, Fruiting fungi, Nuts and fruit, birds leave/arrive

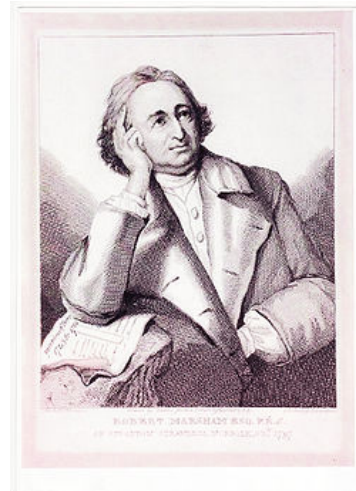
Winter – It snows?!, mosses and lichens 'fruit'

History of Phenology

Robert Marsham, Norfolk, 1708-1797

- 27 spring indicators
- Records of indicators 1736 – 1958
- Interested in tree leafing times

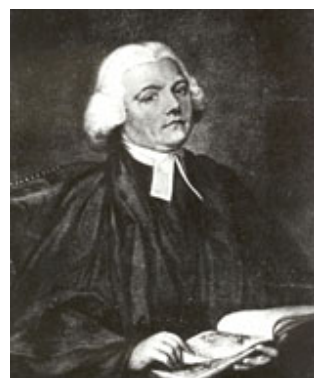
<http://www.robertmarsham.co.uk/>.



History of Phenology

Gilbert White, Hampshire, 1720-1792

- Wildlife observer
- Records of indicators c1768 – 1792
- Interested in summer migrants and birds on migration



History of Phenology

Royal Meteorological Society

1875-1947 co-ordination of a network of recorders throughout UK

History of Phenology

UK Phenology Network 1998- present

Now more than 18,500 recorders
>100 events observed and recorded

Public involvement – BBC Spring/Autumnwatch

<http://www.naturescalendar.org.uk/>.

Results

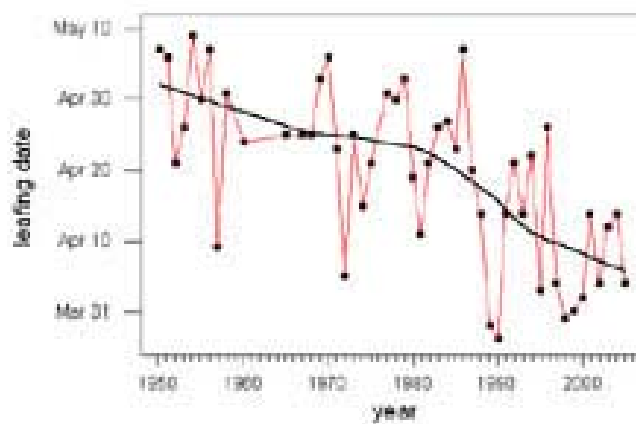
Leaf burst

Trees are coming into leaf earlier in 1980's and 1990's

- Horse chestnut – 12 days earlier
- Oak – 10 days earlier
- Ash – 6 days earlier

Individual studies

Oak leafing date, Surrey, 1950-2005



Results

Early birds

Chiffchaff and Blackcap
are arriving earlier
about 2-3 days per
1°C rise

Results

Christmas mating

Frogspawn is being
recorded earlier
– before Christmas in
South-west England

Results

Butterflies like it hot

Butterfly emergence occurs earlier as temperature rises

Eg Ringlet is a week earlier every 1 °C

Results

Later fall

- Oak leaves falling off a week later
- Longer grass growing season
- Some winter visitors are staying over winter (eg Blackcap and chiffchaff)

[http://www.naturescalendar.org.uk/.](http://www.naturescalendar.org.uk/)



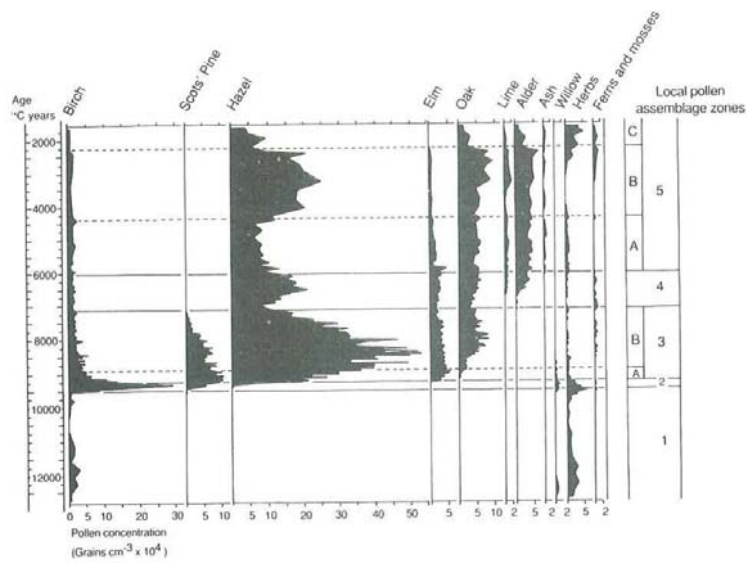
How do we know about past changes to our climate?

Evidence of past climate change



Taking peat and sediment cores and studying pollen and diatoms

Pollen Diagrams



What kind of organisms are quicker to adapt to changes in climate?

What should we record to monitor climate changes?

Dates of migration

Dates in behaviour eg nesting/bud burst/mating/first & last seen

Derbyshire is in a great location to monitor climate change as it is on the boundary between southern and northern Britain.

Some species will move into Derbyshire eg species with a more southern distribution eg White admiral butterfly, rosels bush cricket, long-winged conehead, little egret, bee eaters

Some species will move north out of Derbyshire eg Cloudberry?