

Track Plant and Animal Phenology with Nature's Notebook

Phenology is the study of recurring plant and animal life cycle events such as leafing and flowering of plants, maturation of agricultural crops, emergence of insects, and migration of animals. Phenology is simple to observe and record and is a key indicator of how plants and animals respond to weather and climate. It is considered a valuable indicator of changes in climate.

Nature's Notebook is a program appropriate for scientists and non-scientists alike. It engages observers across the nation in recording phenology observations on both plants and animals.



Nature's Notebook is a great way to engage people in scientific discovery

JOIN US!

Steps to participate:

- 1) Join *Nature's Notebook*
- 2) Set up your account
- 3) Start observing

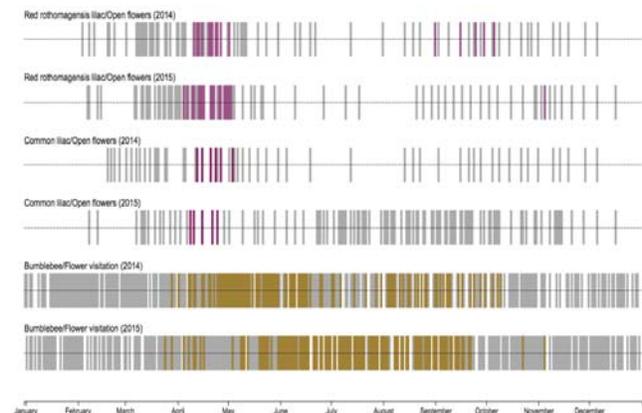
Information on getting started can be found at usanpn.org/nn/guidelines. Training resources are also available online, including narrated videos, scripted PowerPoint presentations, a field handbook, and tip sheets. We can also arrange tailored training webinars for groups interested in participating.



The phenology observations collected via *Nature's Notebook* become part of a data resource that will be used by scientists, decision makers and the public for many decades to come. This information is used to understand how plants and animals are responding to a rapidly warming climate. Phenology data also support management decisions pertaining to allergies, wildfires, water and conservation. Research questions the data may answer include:

- What are the spatial and temporal trends in phenology across the nation?
- Are species range shifts occurring due to changes in climate?
- How does phenology affect our ecosystems?

Interested analysts may download data from the National Phenology Database from usanpn.org/results/data.



Data can be explored using dynamic online visualization tools at usanpn.org/results/visualizations or downloaded at usanpn.org/results/data.



Nature's Notebook in the Field

Nature's Notebook can readily be folded into school curriculum or site-based programs teaching about ecology and natural resources, science, cultural history, and much more. The content is appropriate for middle-school aged youth through adult. Many phenological stages are easy to observe and record, making observing phenology an ideal way to engage students and the public in long-term science. Set up a *Nature's Notebook* group for your organization or class and have many people contribute data and make comparisons through time, or create your own science questions to answer. To get started visit our set up a shared site page at usanpn.org/nn/groups/shared-site.

Valuable Data for Science and Decision Making

The plant and animal phenology observations that *Nature's Notebook* participants have been contributing tell some interesting stories. Researchers have learned that over the past 30 years, the growing season has lengthened by approximately one week in the eastern US and upper Rocky Mountains (Yue et al 2015), that spring may arrive three weeks earlier across the US (Allstadt et al 2015), and that daytime temperatures, rather than nighttime, trigger leafing in temperate plants (Piao et al 2015). Learn more about these and other findings at usanpn.org/nn/vignettes.

CONTACT:

Lorianne Barnett
Education Coordinator
National Coordinating Office
USA National Phenology Network
1311 East 4th Street
Tucson, AZ 85721
E-mail: lorianne@usanpn.org
Phone: 520-621-1803

