

Subject: Springtime Volunteers Watch Plants for Clues to Climate Change
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Springtime Volunteers Watch Plants for Clues to Climate Change

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BOULDER--Volunteers across the country are welcoming spring by taking part in a nationwide initiative, known as Project BudBurst, to track climate change by recording the timing of flowers and foliage. The project, started as a pilot program in 2007 and operated by the University Corporation for Atmospheric Research (UCAR), Chicago Botanic Garden, and University of Montana, is amassing thousands of observations from students, gardeners, and other citizen scientists to give researchers a detailed picture of our warming climate.

An analysis of thousands of Project BudBurst observations from last year and the 2007 pilot shows that volunteers have established a baseline for the timing of key plant events. Volunteers can compare these observations to flowering and leafing in future years to measure the impact of a warming climate.

Overall, 4,861 observations were reported online in 2008 from participants in every state except Hawaii.

"Plants provide a wonderful context for learning about the environment," says Project BudBurst director Sandra Henderson of UCAR's Office of Education and Outreach. "They respond to changes in temperature and precipitation, which are things that climate scientists are very interested in. By observing plants, our volunteers are providing information about our climate that would otherwise not be available."

Project BudBurst is funded by the U.S. Geological Survey, National Ecological Observatory Network, National Geographic Education Foundation, and U.S. Forest Service. The USA National Phenology Network

is one of Project BudBurst's partners. The project is also supported by the National Science Foundation and is hosted on Windows to the Universe, a UCAR-based educational website.

"Project Budburst is a fantastic way for people of all ages to reconnect with the natural world," says Kayri Havens, a senior scientist with the Chicago Botanic Garden. "Getting outside and observing plants is not only fun but can provide valuable data for scientists studying how plants will respond to climate change."

When Havens and Henderson analyzed observations from the last two years, they found some interesting comparisons. In 2008, for example, forsythia in Chicago opened their first flowers from April 17 to 19—almost a week earlier than the 2007 flowering dates of April 23 to 25. In Wadsworth, Ohio, flowering dogwood reached full bloom on May 8, 2008, which was two weeks earlier than in 2007.

Havens and Henderson warned, however, that they could not draw any results about global warming from just two years of data. Scientists will have to analyze observations for many years in order to distinguish the effects of long-term climate trends from year-to-year variations in weather.

"We will need volunteers to make observations for a number of years before we can fill in an accurate picture about the impact of climate change on our landscape," Henderson says.

-----How the project works-----

Each participant in Project BudBurst selects one or more plants to observe. The project website suggests more than 75 widely distributed trees and flowers, with information on each. Users can add their own choices.

Participants begin checking their plants at least a week prior to the average date of budburst--the point when the buds have opened and leaves are visible. After budburst, participants continue to observe the tree or flower for later events, such as seed dispersal. When participants submit their records online, they can view maps of these phenophases across the United States.

"When these data are collected for many years in a row, they reveal hints about how variations in the weather affect plants and animals in our environment," says Carol Brewer, University of Montana biology professor and Project BudBurst co-founder. "When we have data for many years, we can look for signals of climate change in the timing of leafing and flowering."

The science of phenology, or tracking cyclic behavior among plants and animals, has a distinguished history. For centuries farmers, naturalists, and scientists have kept careful records of the phenology patterns of plants and animals. Farmers have long used their phenology

knowledge to predict the best time for planting and harvesting crops and when to start expecting problems with insect pests.

-----A warming trend-----

Numerous plant and animal species throughout the world are being affected by climate change. Some plants respond to warmer temperatures by extending their growing seasons. Others shift their ranges toward the poles or to higher elevations.

At the same time, many insects breed and disperse based on regular cycles of sunlight rather than temperature. This can cause a mismatch between the behavior of pollinating insects, such as bees, and flowers that bloom earlier than the insects expect. Such asynchronous behavior has already been noted across many parts of the world.

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On the Web:
Project Budburst
<http://www.budburst.org>

2008 Summary Results Report
http://www.windows.ucar.edu/citizen_science/budburst/PBB2008Summary.pdf
USA National Phenology Network
<http://www.usanpn.org>

Resources for journalists:
<http://www.ucar.edu/news/journalists.jsp>

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