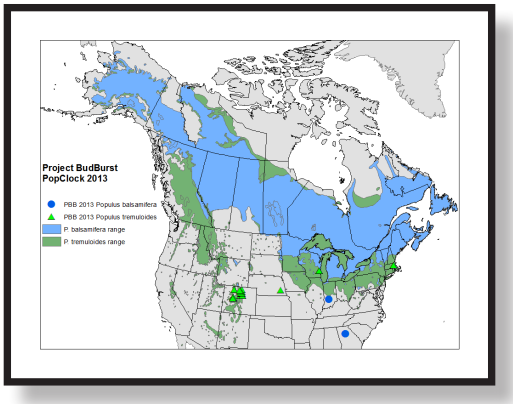
PopClock

Newsletter Fall 2013

What is PopClock?

PopClock is a partnership between scientists and volunteers to study climate change impacts on poplar trees. With a grant from the National Science Foundation, our research team from the University of Maryland Center for Environmental Science Appalachian Laboratory is examining how forest trees are responding to rapidly changing climatic conditions. As part of this effort, we are working with U.S. and Canadian volunteers, or "citizen scientists," to collect ground-based observations of spring leaf emergence and fall color change of two poplar species—balsam poplar (*Populus balsamifera*) and quaking aspen (*Populus tremuloides*). We will use these observations to create maps of "green-up" and "green-down," which we will combine with genetic information to identify areas where trees are most and least adapted to climate change. The results will be an important tool for forest management. We are partnering with Project Budburst, along with two other citizen science programs (National Phenology Network and Plant Watch), to recruit volunteers and manage the on-the-ground data.



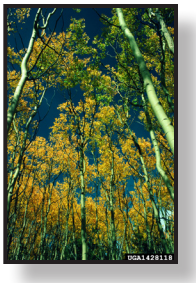
What's up with PopClock?

The project began its first season in spring 2013, and we were excited to recruit of our first group of Project Budburst citizen scientists. These volunteers reported on dates of spring leaf emergence in stands of balsam poplar and quaking aspen from across the continent—Alaska to the Rockies and east to the Great Lakes and New England. Between January and August of this year, over 40 observations have been collected on quaking aspen, plus a few for balsam poplar. Great job folks! These observations will be invaluable to us as we begin analyzing how genes and the environmental control poplar phenology (think of this as "nature/nurture"), and how we can use satellite data to estimate poplar phenology (the timing of changes in plants) over large areas.

What willl Happen this Fall with these Poplar Trees?

Both quaking aspen and balsam poplar leaves turn a beautiful golden to yellow color in the fall. Trees use genes, such as phytochromes, to sense where they are within the growing season, and then make appropriate responses in phenology. When trees sense the shorter day length and cooler temperatures of fall, their genes start producing plant hormones that stop stem growth, prepare their buds for cold weather, and cause leaves to change color and fall off.

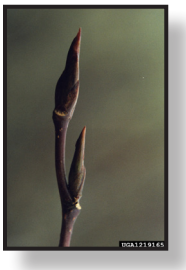
Through the PopClock project, we are studying how interactions between genes and the environment vary for poplar trees growing in warm versus cold locations in the U.S. and Canada. Our results will help understand how trees will respond to climate change. Thus, we need help from lots of volunteers in many climate zones of North America to report dates when balsam poplar and quaking aspen change color and produce spring leaves.



William Ciesla, Forest Health Mgmt Int'l Bugwood.org

Can I Join PopClock Now?

YES, we're always looking for new participants! You may join at any time. Just find a stand of balsam poplar and/or quaking aspen, check the stand periodically, and record the date when leaves change color in the fall and when leaves first emerge in the spring. You can record other changes in the trees (called *phenophases*) as well, but we are most interested in leaf emergence and color change. Next go to the Project Budburst website, create an account (if you don't have one), and enter your data. We hope you continue to follow your stands for two or three years; this will ensure we have all the necessary data to make our predictions about how northern forest trees will respond to climate change. Go to our Project Budburst's PopCock website for more information on collecting and entering your data (**http://www.budburst.org/popclock**). Your efforts are much appreciated!



Bill Cook, Michigan State U, Bugwood.org

For more Information on the PopClock Project...

- ★ Check us out on Project Budburst – **http://www.budburst.org/popclock**
- ★ Email us if you have any questions or insights to share; we'd love to hear from you – **citizen.science@al.umces.edu**

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