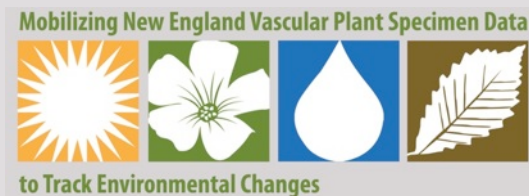


Mobilizing New England vascular plant data to track environmental change: Education & Outreach

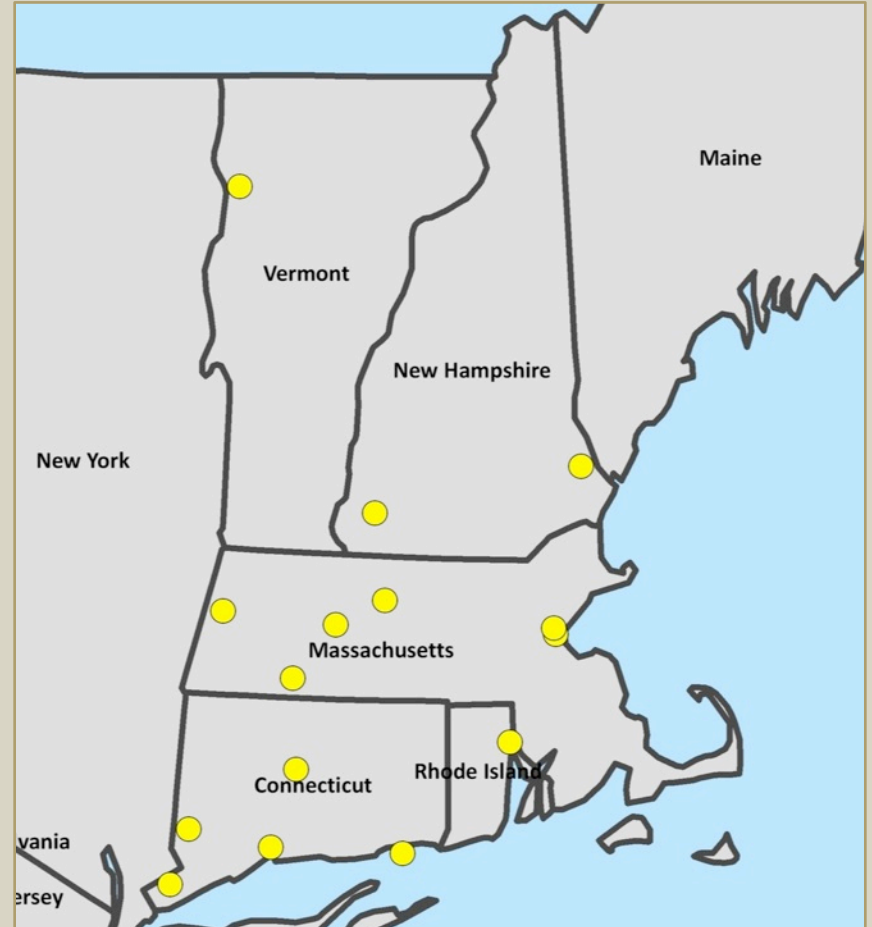
P.W. Sweeney

Yale Peabody Museum of Natural History



OBJECTIVES

- Digitize 1.3 million N.E. vascular plant specimens from 15 regional herbaria



OUTLINE

- Training Activities
- Citizen Science efforts
 - New England Leaf Out Project (NELOP)
 - CURIO
 - YUBio



TRAINING



	Undergraduates	Graduates/Post-docs	Staff
Digitization	7	1	5
Herbarium	2 (+7)		
Outreach	2	2	

TRAINING

■ Evolutions

- Collaboration with the Yale Peabody Museum's after school program for high school students, "Evolutions"
- offer internships to six high-school students



OUTREACH

- New England Leaf Out Project (NELOP)
- Richard Primack
(Boston University)



© Richard Primack

OUTREACH

■ NELOP

- Enlist citizen scientists to submit leafing out data
- Build on existing networks



Red maple
Acer rubrum



Sugar maple
Acer saccharum

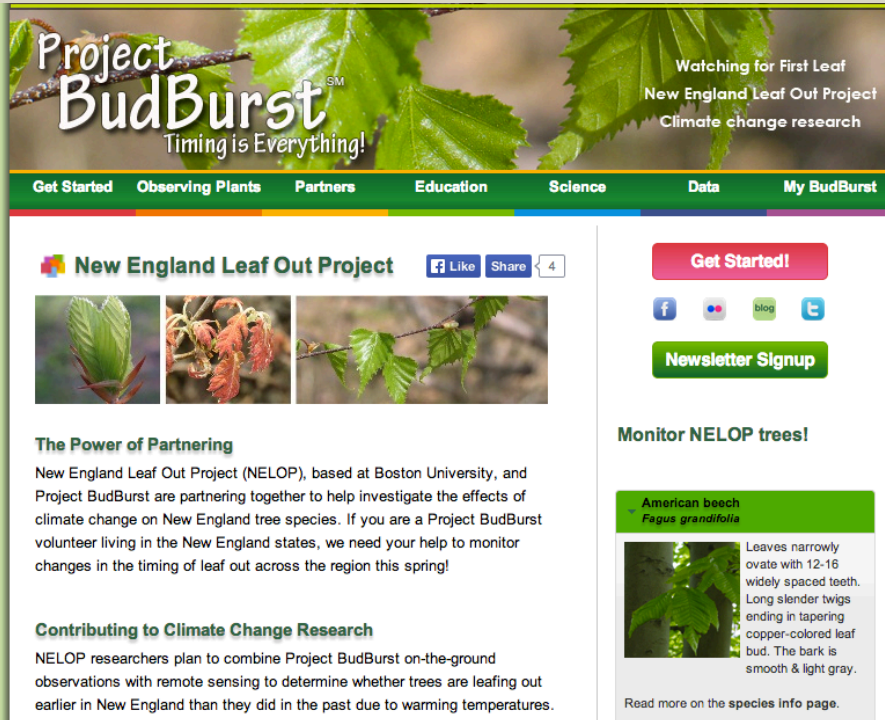


Black birch
Betula lenta



© Richard Primack
Paper birch (*Betula papyrifera*)

OUTREACH

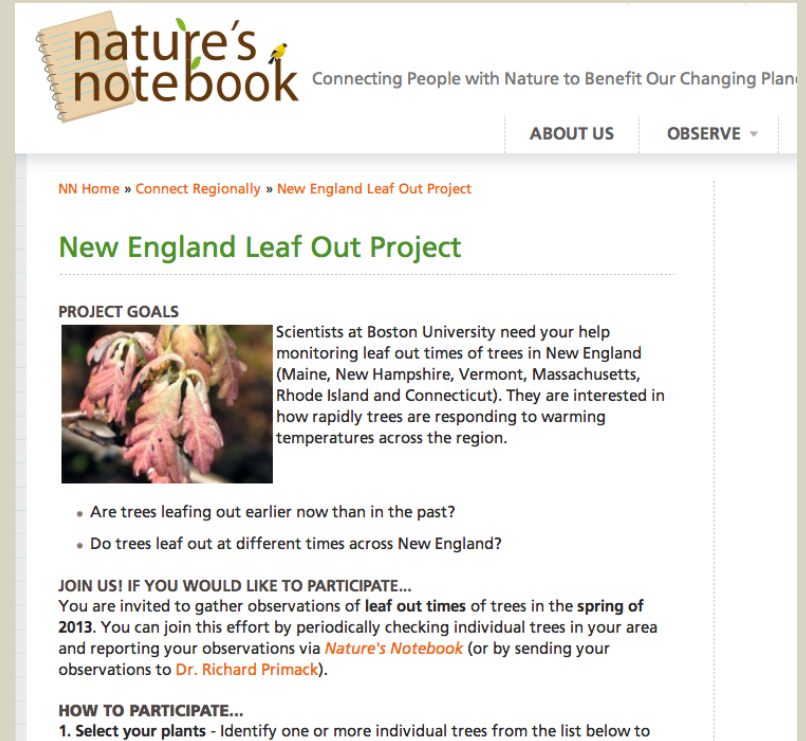


The Project BudBurst website features a green and white color scheme. The header includes the logo "Project BudBurst" with the tagline "Timing is Everything!" and the text "Watching for First Leaf New England Leaf Out Project Climate change research". A navigation bar contains links: Get Started, Observing Plants, Partners, Education, Science, Data, and My BudBurst. The main content area is titled "New England Leaf Out Project" and includes a "Like" button, a "Share" button, and a "4" in a box. Below this are three small images of leaves. The text "The Power of Partnering" is followed by a paragraph about the New England Leaf Out Project (NELOP) and Project BudBurst. A section titled "Contributing to Climate Change Research" describes the project's goals. On the right side, there is a "Get Started!" button, a "Newsletter Signup" button, and a "Monitor NELOP trees!" section. The "Monitor NELOP trees!" section includes a "American beech" entry with a photo of a leaf and a description: "Leaves narrowly ovate with 12-16 widely spaced teeth. Long slender twigs ending in tapering copper-colored leaf bud. The bark is smooth & light gray." A link "Read more on the species info page." is provided.

Project BudBurst

Project Budburst

<http://www.budburst.org/nelop/index.php>



The Nature's Notebook website has a white background with a green and brown logo. The header includes the text "nature's notebook" and "Connecting People with Nature to Benefit Our Changing Planet". A navigation bar contains links: ABOUT US and OBSERVE. The main content area is titled "New England Leaf Out Project" and includes a "PROJECT GOALS" section. The "PROJECT GOALS" section includes a photo of a leaf and a paragraph about the project's goals. Below this is a list of goals: "Are trees leafing out earlier now than in the past?" and "Do trees leaf out at different times across New England?". A section titled "JOIN US! IF YOU WOULD LIKE TO PARTICIPATE..." includes a paragraph about the project and a link to "Nature's Notebook". A section titled "HOW TO PARTICIPATE..." includes a list of steps: "1. Select your plants - Identify one or more individual trees from the list below to".

Nature's Notebook

National Phenology Network

www.usanpn.org/nn/nelop

OUTREACH




Field Station Concordia and the New England Leaf Out Project have teamed up on a citizen science project to collect leaf out times.

We are investigating the effects of climate change on the tree species of New England. Using both remote sensing and direct observations, we will monitor leaf out times across the region, and whether trees leaf out earlier now than they did in the past due to warming temperatures.

We hope you will help us gather observations of leaf out times this spring to add to the available database of current and historical observations.

If you live in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island or Connecticut, all you need to do is:

- Find one or more trees from the list below in a place that you visit regularly
- This spring, starting in mid April in Connecticut and late April elsewhere, check your tree every couple of days, and look for the first signs of leaf out
- Submit your observations [here](#)
- Please include any information about the tree's environment (high on a mountain, urban street, etc.)

 [Enter your observations](#)

What is leaf out?

Leaf out: Please record the date that you first see one, or up to several, new leaves on the tree. In this study, we count a new leaf when it has mostly emerged from the bud and its final shape is mostly visible. This observation should be made in spring when the first leaves are emerging. These young leaves often have a soft or translucent quality to them, and may not yet be green. Please do not report observations of leaves that have reached their full size.



Red Oak, © Richard Primack

Field Station Concordia

<http://leaf-out.fieldstation.net/>

OUTREACH



© Richard Primack

OUTREACH

- **NELOP - Year 1**
 - established infrastructure
 - began volunteer recruitment
 - Ca. 200 volunteers in Year 1
 - began data collection
 - Ca. 425 observation records



OUTREACH



Curio is a crowdsourcing platform that connects interested citizens with researchers to help answer important questions in the sciences and humanities.

Enter your email below to receive an invitation for early access.

Notify me!



© 2013 Curio. This research is supported in part by the National Science Foundation.

<http://www.crowdcurio.com/>

OUTREACH

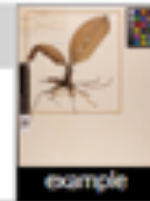


What is the phenophase of the plant specimen in the test image?

A

before flowering

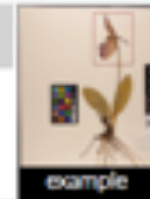
The plant has no flowers or fruits.



B

flowering

The plant has a stalk with one or more flowers.



C

after flowering

The plant has a stalk with fruits, but no flowers.



ACKNOWLEDGEMENTS



Richard Primack (BU), Libby Ellwood (iDigBio), others



Edith Law (Center for Research on Computation and Society, Harvard University), Chuck Davis (Harvard U. Herbaria), NSF



National Science Foundation (EF1208829, EF1208835, EF1208972, EF1208973, EF1208975, EF1208989, EF1209149)



OUTREACH

YUBio Home Search My Account Logout About Welcome Patrick Sweeney

YUBio Data Portal




Thanks for your contributions as a citizen scientist at Yale. Your observations count! Use this data entry portal to record bird and plant sightings from around the Yale campus.

Welcome to the Yale Biodiversity Citizen Science Initiative

The Office of Sustainability has partnered with the Yale Peabody Natural History Museum on the Yale Biodiversity Citizen Science Initiative. The goal of the program is to train students, faculty and staff to survey and record biodiversity on campus. Participants gain bird and plant identification skills and develop a better understanding of urban ecology in 'ordinary' spaces while assisting scientists in gathering large, continuous datasets. Data collected by citizen scientists through this portal will be compared with climate and weather data to understand trends pertaining to migratory bird patterns and plant phenology. Such data may be used to inform land-use planning at Yale in the future.

If you are a new site user you must first register before you can enter data. See Register tab in above menu.

Latest Observations

Image	Scientific Name	Common Name	Locality	Observed By	View more details
	<i>Coragyps atratus</i>	Black Vulture	Kline Biology Tower courtyard	Kristof Zyskowski	View Observation
	<i>Seiurus aurocapilla</i>	Ovenbird	below ESC-KGL building connector	Kristof Zyskowski	View Observation
	<i>Spinus tristis</i>	American Goldfinch	Medical School	Gail Cameron	View Observation

<http://peabody.research.yale.edu/yubio/>

OUTREACH

YUBio [Home](#) [Search](#) [My Account](#) [Logout](#) [About](#) **Welcome Patrick Sweeney**

Submit an Observation

Type Of Observation

Plant

IDENTIFICATION

Taxon Search *

Identification Remarks

DESCRIPTION

Description

Number

Plant Condition

Flowering Stage

---Select One---

Leafing Stage

---Select One---

Fruiting Stage

---Select One---

DATE

Event Date *

LOCATION

Locality *

Habitat

City

New Haven

How would you like to enter locality data?

---Select One---

OTHER

Yale Tree Tag Number

Image Uploads

By uploading images to this site, you grant the Peabody Museum of Natural History, Yale University, the none

OUTREACH

View Observation

Observed By:



Gail Cameron

Observed On:

October 16th, 2013

Common Name:

[Sugar Maple](#)

Scientific Name:

Acer saccharum

Identification Remarks: In park with many planted specimens, this one will be my "phenology" tree

Number:

1

Description:

full color on leaves, one section of tree on top has already lost it's leaves

City:

New Haven

Location:

Medical School, Amistad Park

