Introduction to Phenology Data

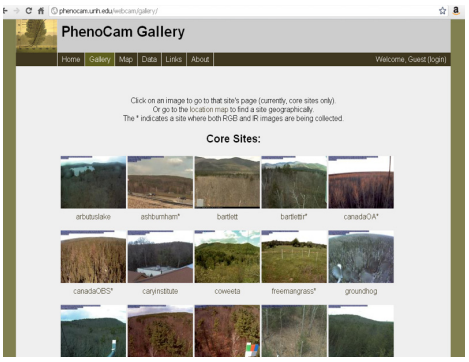
Downloading PhenoCam Images

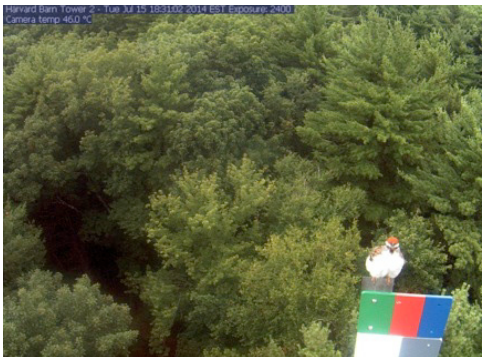
Introduction

In this tutorial, you will learn how to download images from any site in the PhenoCam Network and get activity ideas for using the images with your students. Students can use the images to make time lapse series and analyze changes in phenology over time or use them to make Phenomovies. With more than 80 cameras at different sites uploading imagery to the PhenoCam server every half hour, there are many photos to choose from!

Estimated Time:
15-30 minutes

Materials: Internet connectivity, an Internet browser (e.g., Google Chrome, Mozilla Firefox, etc.)

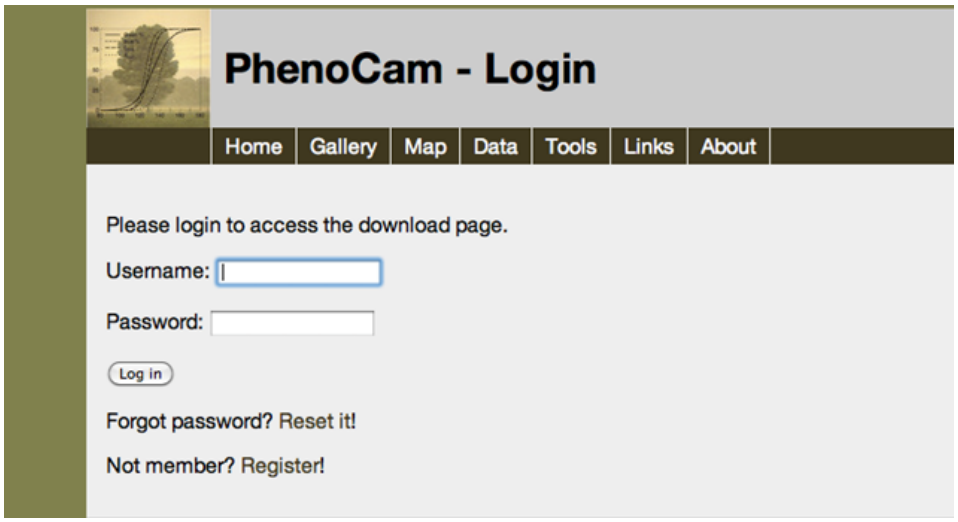




Activity Instructions

Create an Account

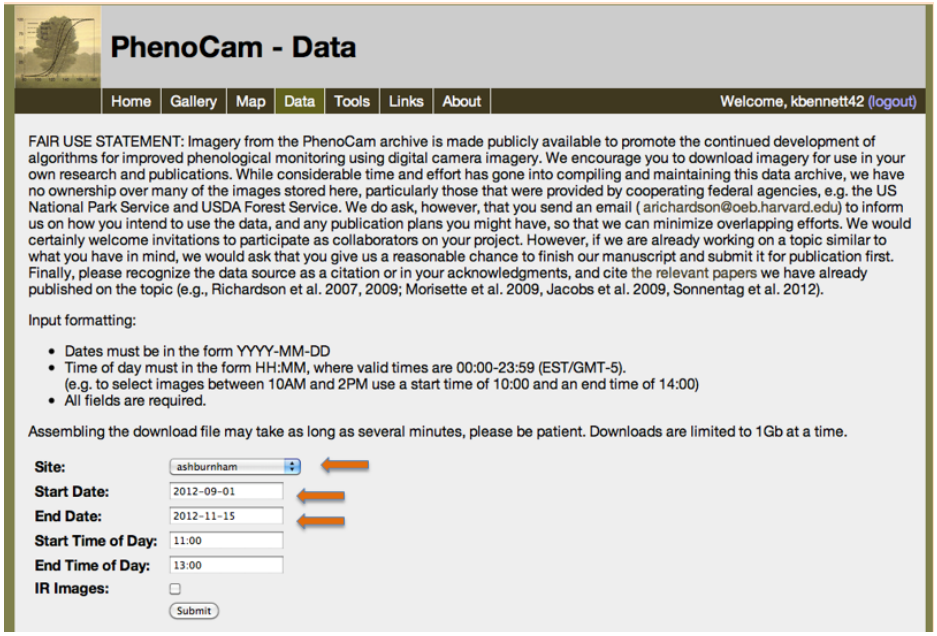
1. Go to the PhenoCam website. Click on the data tab. It will bring you to this page (see image below). Before you can download data you have to set up an account. It's easy and free - then you can log in.



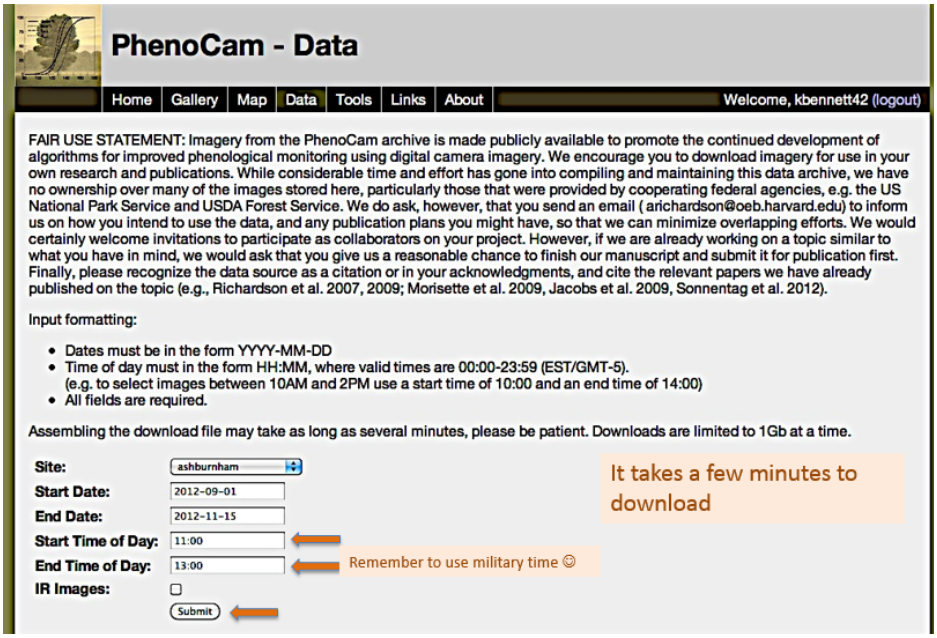
What to learn more about PhenoCam Photos and Data?
Check out the other *Unit 3: Introduction to PhenoCam Data materials*

Select the Data

2. Now you can choose a site, a start date, and an ending date. You can choose to look at a year or years in one location or just one growing season or phenology event such as bud burst.

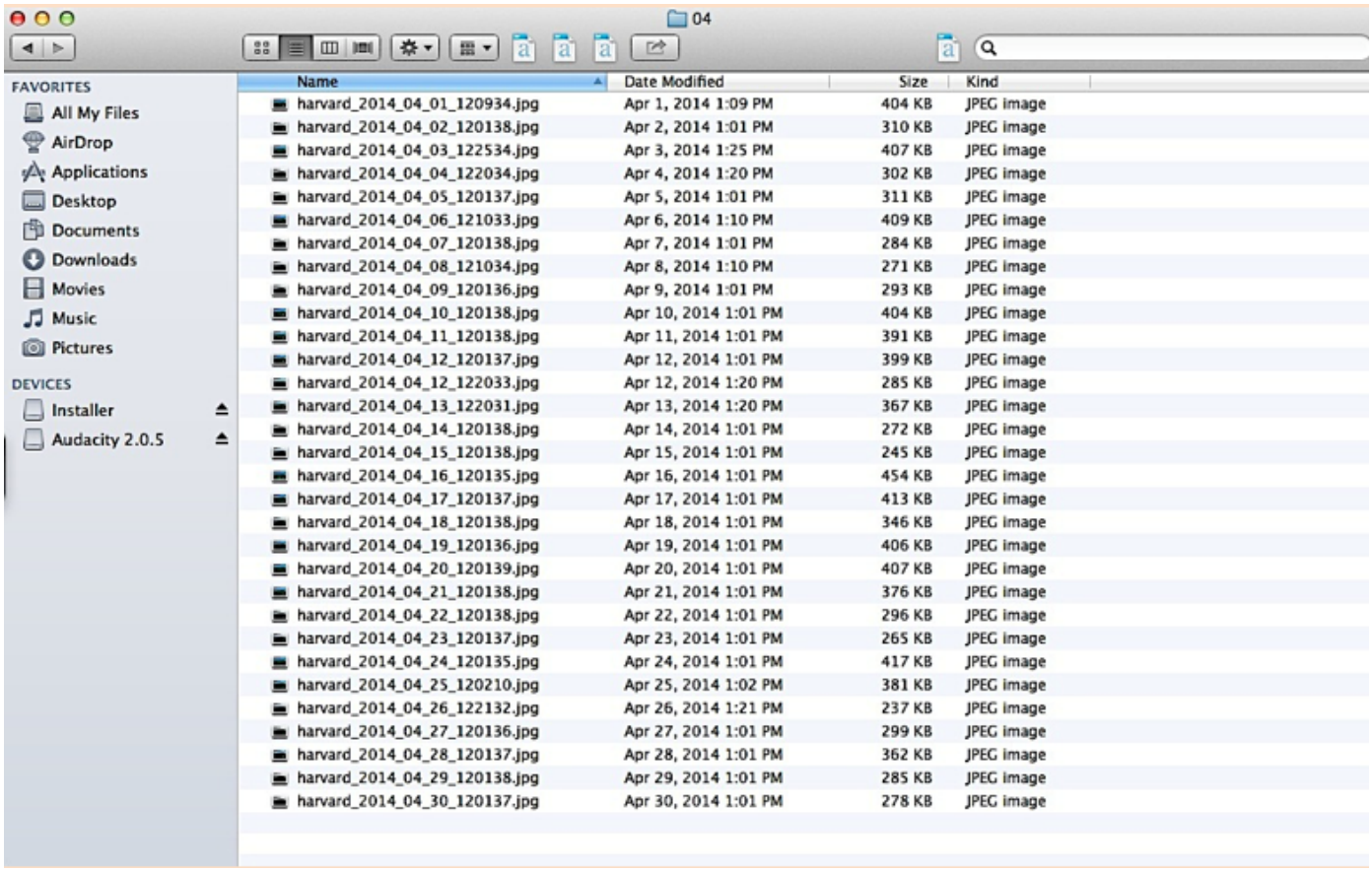


3. Now you can choose a time range. You will probably want to start with images around noon for the best light. You can check on that site's page to see how many images are taken during that time and think about how many images you want. Remember to use military time. Then click submit. It takes a few minutes to download.



View the Downloaded Data

4. Now you will have a folder (or folders) of the images you requested.



What can you do with PhenoCam images?
Check out the activity ideas on the following pages!

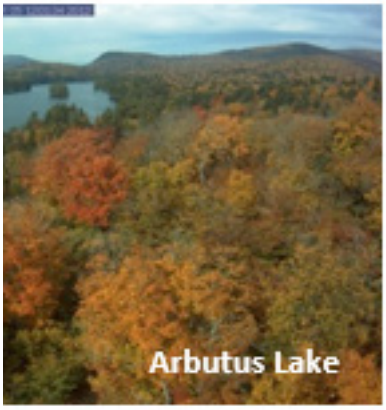
Activity Ideas

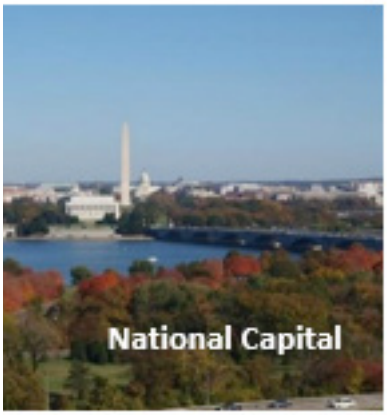
PhenoCam Image Activities

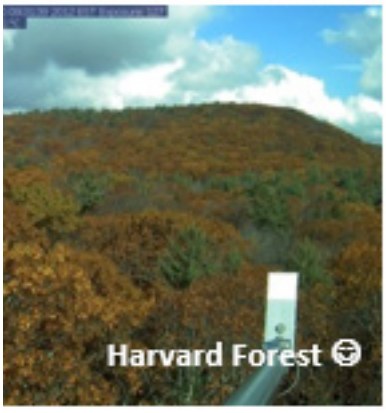
1. Make PhenoMovie Trailers (*Phenology 101 Unit 1 Activity* - http://budburst.org/phenology-101)

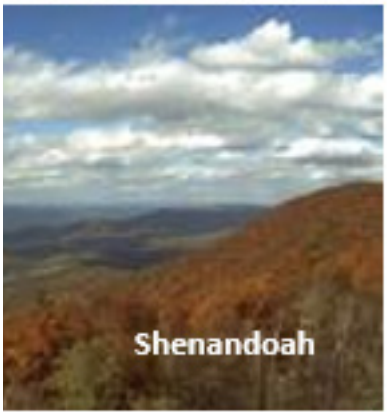
2. Use Phenocam images to compare the timing of major phenological events in different latitudes, elevations, or climates.

Site Name	Latitude
shenandoah	38.5926
national capital	38.8882
usgsreston	38.9471
woodshole	41.5495
caryinstitute	41.7839
northattleboroma	41.9837
springfieldma	42.1352
harvard	42.5378
ashburnham	42.6029
hubbardbrook	43.9439
arbutuslake	43.9821
bartlett	44.0646
queens	44.565



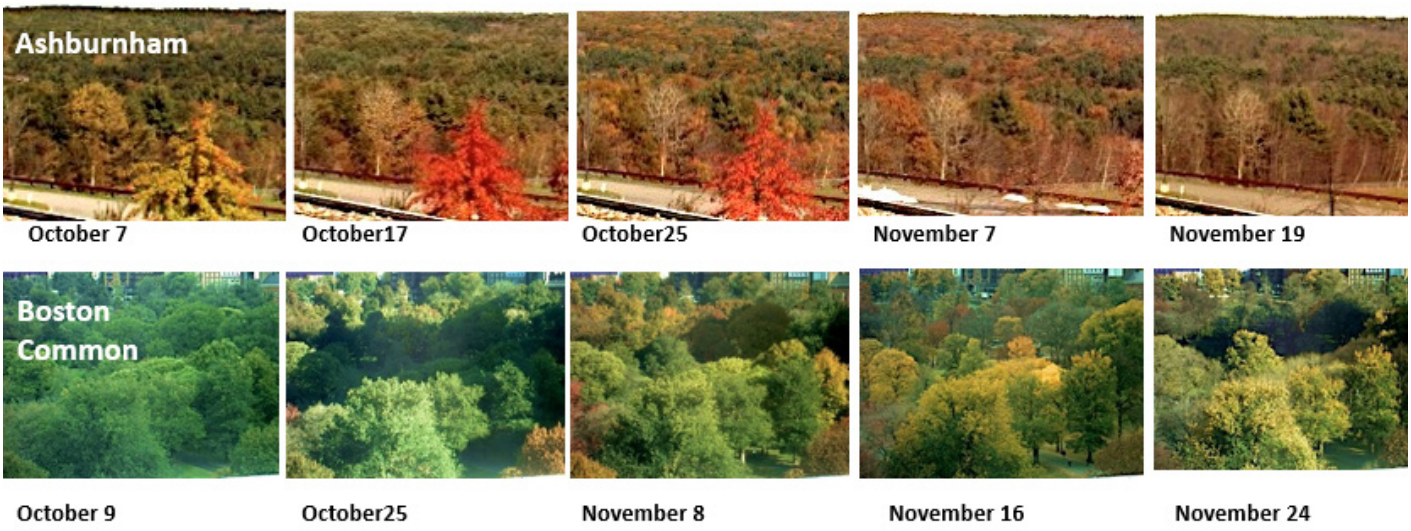






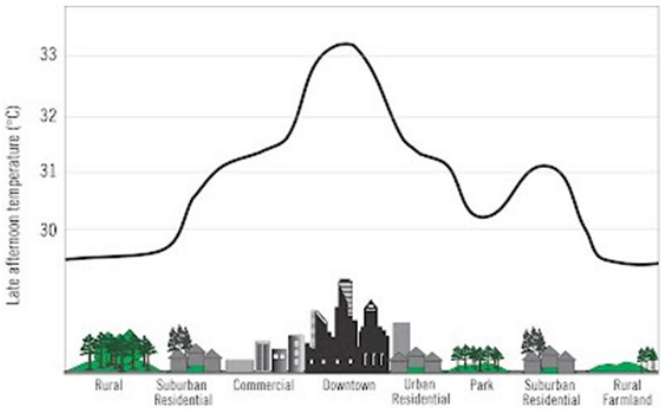
PhenoCam Image Activity Ideas (cont.)

3. Compare rural and urban sites to look at the urban heat island effect (see below). For example, you could have students compare the images from Ashburnham, MA to those from Boston Commons.



Background Information: Urban Heat Island

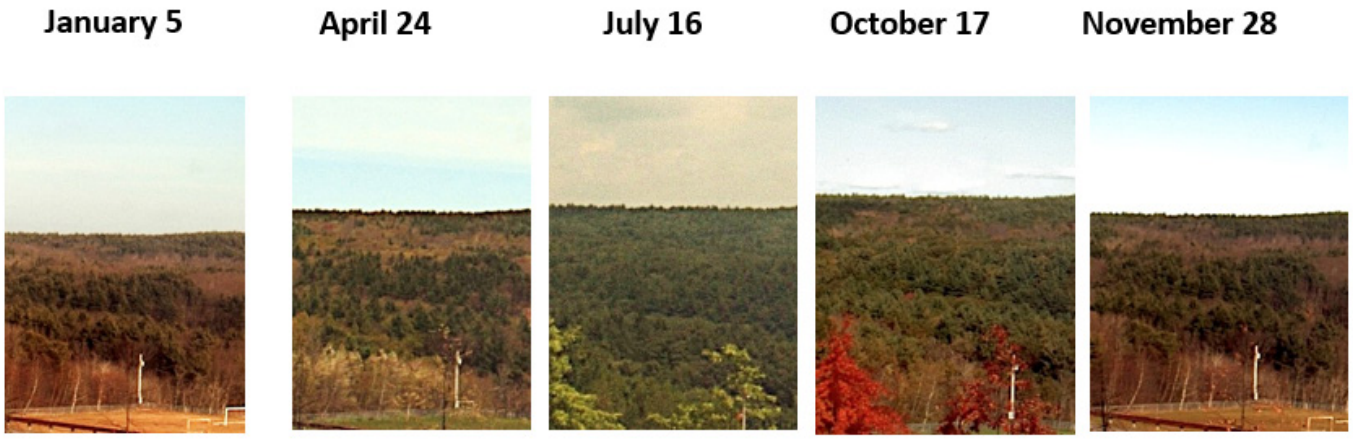
As developed areas expand, the amount of heat retained also grows and the amount of air that is warmed, expands. This process is sometimes referred to as the "Urban Heat Island Effect." This compounding warming effect in turn triggers variability in phenophase timing. A red maple (*Acer rubrum*) in a developed area, may experience initial stages of the leaves unfolding sooner than a red maple in an undeveloped area. On a smaller spatial scale, a red maple next to an asphalt road, may also flush sooner than a red maple that is close to the interior of a forest, or to a stream filled with cool running water.



PhenoCam Image Activity Ideas (cont.)

4. For younger learners: Look at the seasons or even the weather on particular dates, such as holidays or on their birthdays, at various locations. For example, you might compare how a PhenoCam near you looks versus a PhenoCam near a relative's home.

Ashburnham, Massachusetts throughout the year



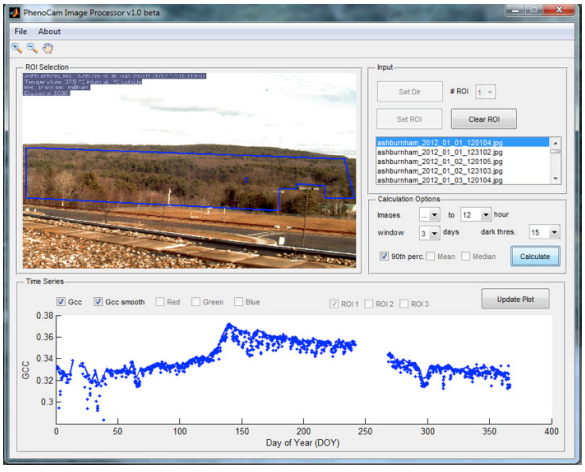
Wrap-up

Summary and Next Steps

By downloading images from the PhenoCam website, your learners will have access to phenology data from across the United States. The activities described above are intended to spark ideas for using PhenoCam images with your learners and by no means are an exhustive list!

What's next?

If your learners are comfortable working with PhenoCam images, you might consider introducing them to Green Chromatic Coordinate or GCC data (see image to the right). GCC values are the green level in an image divided by the levels of red, blue, and green added together. This number can tell you when bud burst happened and when the leaves turn color in the fall. The following resources will help you get started with GCC data:



Phenology 101 - Unit 3
Introduction to Phenology Data - Background Guide
PhenoCam Data Matching - Activity
Graphing PheynoCam Data - Activity