Monitoring Phenology Activity

Classify Images with Season Spotter

Introduction

The PhenoCam Network partnered with Project BudBurst to create a new citizen science effort – Season Spotter. Utilizing a new platform on Zooniverse, Season Spotter was designed to engage individuals in making more in-depth image classifications that are beyond a computer's current capacity. This engaging project asks people of all ages to view PhenoCam images and answer a few simple questions about each one. The answers to these simple questions in turn help the PhenoCam team improve the computer program that analyzes the images. Be careful, classifying these phenological images can be addicting!

Estimated Time:
30 minutes - 1 hour

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

Backgound Information

The PhenoCam Network (phenocam.unh.edu) uses automated digital cameras mounted on towers and platforms to create a record of seasonal change in vegetated landscapes across North America. More than 250 networked cameras capture images of forests, grasslands, croplands, shrublands, and tundra on a continual basis (every 30 minutes). The result is thousands of images taken every day. The images provide a unique record of how plants respond to seasonal change including the timing of leafing, flowering, and fruiting – at the landscape level.
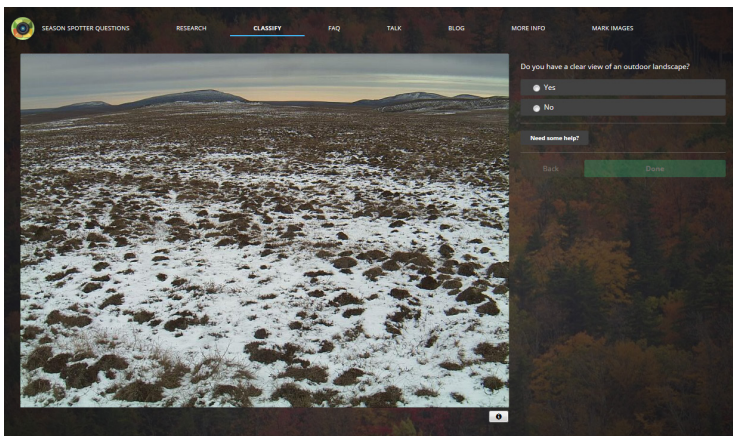
Above: Screenshot of the Season Spotter interface. Participants are presented with an image from the PhenoCam Network then annotate the image or answer a series of questions. This information helps the PhenoCam team improve their computer program for analyzing images.

Many of the images from The PhenoCam Network are automatically classified or categorized by computers using algorithms developed to detect change in the greenness of vegetated landscapes. Generally speaking, computers and humans do a good job classifying images of seasonal transition dates (e.g. the start of spring green-up). It makes good sense to use computers to automate this type of classification given the large number of images needing classifying. However, it turns out that computers are not as good at identifying phenological transitions such as flowering or fruiting, or that might be more abstract or subjective in nature (e.g. "intensity" of autumn colors). But humans are very good at this type of classification. In many instances, humans are much better at tasks involving visual skills, reasoning, and especially pattern recognition. However, this takes a significant amount of time.

Season Spotter provides a crowdsourcing approach to be integrated with current image analysis routines to maximize the amount of phenological information that can be extracted from the images.

seasonspotter.org

Activity Instructions

Task 1: Classify Images

Have your learners (either individually or in groups) classify two (or more!) images on seasonspotter.org. They can choose either of the two ways to classify: answer multiple choice questions OR answers questions and mark features. At the end of each set of questions, have your learners take a screenshot/grab of the summary page (see image below) and answer the discussion questions below.
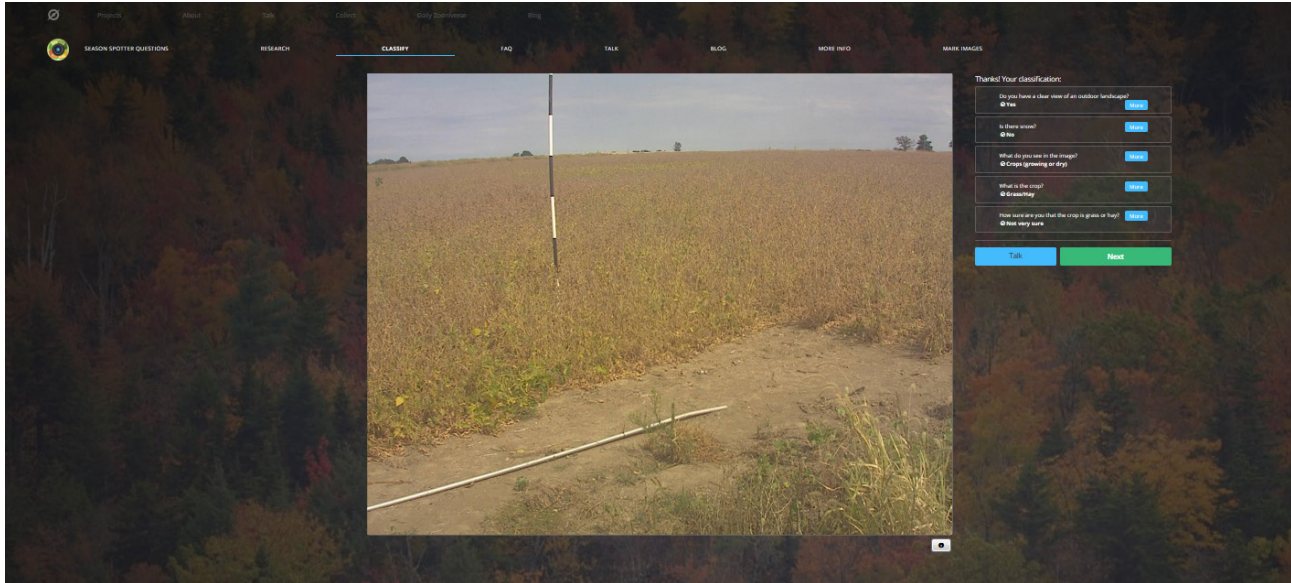
Task 2: Discussion Questions

Have your learners compose a description (1-3 paragraphs recommended) including the following information:

- Screenshots/grabs of your image classification summary

- A brief description of your experience classifying images with SeasonSpotter.

- Which of the two ways did you try selecting images?

- Did you find classifying the images easy or difficult? Why?

- How might the questions you were asked and/or features you were asked to mark while classifying relate to testing how the PhenoCam computer program calculates greeness?

Results could be presented in a report or as a presentation/discussion as a class.

Wrap-Up

The PhenoCam Network collects thousands of images from its network of cameras, representing an enormous wealth of data that must be analyzed. After classifying images, your data will be submitted to Season Spotter's online database so that PhenoCam scientists can improve the computer algorithms developed to detect change in the greenness of vegetated landscapes. By taking the time to answer a few simple questions, you and your learners can help scientists learn more about the responsiveness of individual plant species to changes in climate locally, regionally, and globally. Participating in Season Spotter not only allows your learners to to make meaningful contributions to ongoing scientific research, but it also gives students hands-on experience making observations and thinking critically.