**Preparation**

In advance of the first lab students read two papers:

* Abraham J. Miller-Rushing and Richard B. Primack. (2008). Global Warming and Flowering Times in Thoreau's Concord: A Community Perspective. Ecology, Vol. 89, No. 2, pp. 332-341.
* Forrest and Miller-Rushing (2010) 'Toward a synthetic understanding of the role of phenology in ecology and evolution.' Phil. Trans. R. Soc. B (2010) 365, 3101–3112.

At the beginning of lab the class also took a 1-hr walking tour of the campus to make some observations on phenological changes in early spring and practice applying phenological terms and concepts to local species.

**Course context**

The module was used in lab immediately following lecture material on pairwise interactions in ecology (emphasizing consumption, competition, mutualism), and parallel to community ecology (emphasizing food web structure, succession, resistance and resilience).

Students worked in pairs on each assignment. Data and assignments were distributed via the course management system (BlackBoard), and group responses were collected electronically as well.

**Future changes**

The most significant challenge for my students (or at least what I got the most questions about) was linking the data back to the theory and to the literature.

* Based on their responses to the assignments they had trouble reading and understanding the Forrest and Miller-Rushing review paper. I will need to provide a guided discussion of this paper in class to help them link the activity to concepts in the readings and textbook.
* The text has a chapter on the ecology of climate change, but does not list phenology in the index, making it difficult for students to quickly find background information. I will need to add notations to the student assignment sheets directing them to the appropriate section of the text.

The original concept for applying this module was to look at differences between inland and coastal climates in the northeastern US. Due to time constraints I was unable to assign students the task of finding phenological data sets in the region. Assembling a dataset for Exercise 3 and expanding the climate regions in Exercise 2 to match that set is a priority for the future.

Also, I wasn't able to spend as much time as I wanted to have them gather their own phenology data in the field, so that’s a goal for the next instance of the course.