Instructor Notes on: [**Investigating the footprint of climate change on phenology and ecological interactions in north-central North America**](http://ecoed.esa.org/index.php?P=FullRecord&ID=539&ReturnText=Search+Results&ReturnTo=index.php%3FP%3DAdvancedSearch%26Q%3DY%26FK%3Dphenology%26RP%3D5%26SR%3D0%26ST%3DQuick) (Kellen Calinger\*, The Ohio State University, 2014)

I broke this module into 6 different assignments that groups of 4-5 students worked on together through a 7-week term. This was for an introductory Biology majors class (Biodiversity) with lectures and no laboratory component. Students completed almost all of this work outside of class.

Assignment 1 was a premodule assignment where the students had to find and read primary literature and explain concepts like trophic cascade and trophic mismatch (see Assignment 1 attachment).

Assignment 2 followed Exercise i (Regional Long-term Temperature Trends).

Assignment 3 followed Exercise ii (Statewide Long-term Temperature Trends). I modified this assignment by not giving the students the spring temperature change values for each of the 10 divisions. Instead I had them calculate these values and provided a table for them to enter their data.

Assignment 4 followed Exercise iii (Biological Indicators of Climate Change: Flowering Time).

Assignment 5 followed Exercise iv (Biological Indicators of Climate Change: Butterfly Emergence and Hummingbird Arrival Times) and Exercise v (Debunking a climate change skeptic tactic). In addition, at the end of Exercise iv I added a component where students had to find the original research article, read it, and answer additional interpretation questions (see Assignment 5 Supplement attachment). Please note in Calinger’s file the table for Species and Arrival Time Change has the wrong values. The correct values are as follows: *Celastrina ladon* = -1.40 and *Archilochus colubris* = 0.55. This is important if students are going to the actual article themselves.

Assignment 6 is a final project where students integrate materials from the term and the module to create and present an informational poster to the class (see Assignment 6, Poster rubric, and Presentation rubric attachments).