



Community Spotlight

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Investigating the footprint of climate change on phenology and ecological interactions in north-central North America

By Kellen Calinger



Module Description:

In this lab module, students work with large datasets to evaluate long-term temperature change and its impacts on flowering phenology, pollinator emergence and arrival phenology, and emergent trophic mismatches. Students address questions such as: Have long-term temperatures changed throughout Ohio? How will these temperature changes impact plant and animal phenology, ecological interactions, and, as a result, species diversity?

In this lab module students will:

- Produce and analyze graphs of temperature change using large, long-term data sets (synthesis, Analysis)
- Develop methods for calculating species-specific shifts in flowering time with temperature change (Synthesis)
- Describe the ecological consequences of shifting plant and animal phenology (Comprehension)
- Evaluate data "cherry-picking" as a climate change skeptical tactic (Evaluation)

This lab module includes open-ended inquiry, guided inquiry, and cooperative learning teaching strategies. Students also practice critical thinking skills.

Teaching Setting:

This lab was designed for ecology students to complement in-class lectures on climate change.

QUBES Citation:

Calinger, K. (2018). [Investigating the footprint of climate change on phenology and ecological interactions in north-central North America](#). [Ecological Society of America](#), QUBES Educational Resources. [doi:10.25334/Q4667X](#)

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Related Materials and Opportunities:

This lab module was originally published in [Teaching Issues and Experiments in Ecology \(TIEE\)](#) (see the TIEE citation below) and is also one of many resources available at the [EcoED Digital Library](#).

Kellen M. Calinger. April 2014, posting date. Investigating the footprint of climate change on phenology and ecological interactions in north-central North America Teaching Issues and Experiments in Ecology, Vol. 10: Practice #1 [online].
<http://tiee.esa.org/vol/v10/issues/datasets/calinger/abstract.html>

The module was adapted by participants in the [Ecological Society of America \(ESA\)-sponsored Data Discovery Faculty Mentoring Network \(FMN\) in Spring 2017](#). The FMN participants tailored the module to their classrooms, which included both lecture and lab courses for both upper level and introductory students, by altering its length, modifying the dataset used, adding activities, and even switching the primary focus of the module, which has resulted in a rich collection of resources customized for a variety of educational settings. Cumulatively, this collection of resources has had a huge impact, with a whopping total of 2000+ views and 300+ downloads! Click on the “Adaptations” tab in the [full resource record](#) to view all of adaptations of this original resource. [Browse through other ESA FMN products.](#)

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