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Testing hypotheses about the role of wild in structuring avian communities

By Lesley Bulluck



Module Description:

This week's featured resource is a module that assesses the role of wildfir

the eastern US and its impact on bird communities using NEON bird survey data from pre- and post- a major wildfire in the Great Smoky Mountains National Park (GRSM) in November 2016.

Students build on fundamental concepts of disturbance ecology and its role in structuring wildlife communities. This module specifically assesses the role of wildfire in the eastern US and its impact on bird communities using NEON bird survey data from pre- and post- a major wildfire in the Great Smoky Mountains National Park (GRSM) in November 2016. Over two class/lab periods, students learn about natural disturbances in the eastern US and develop hypotheses about the GRSM case study, and then carry out data analysis using NEON bird survey data to test their hypotheses. Bird survey data from summer 2016 are used as pre-burn data and bird surveys from summer 2017 and 2018 are used as post-burn data, where some survey plots were affected by the burn and others were not. A Before-After-Control-Impact (BACI) design is used to determine whether species richness and diversity was affected by the fire. Students are challenged to think about how to 'wrangle' data from NEON downloads so they can be used to calculate diversity indices and test hypotheses about changes in those indices pre- and post-wildfire.

By the end of this module, students should be able to:

1. Develop hypotheses about the role of natural disturbance (specifically wildfire) on the distribution and abundance of birds in GRSM,
2. Understand how to use a Before-After-Control-Impact (BACI) design to test hypotheses using NEON bird data collected before and after a wildfire,
3. Wrangle and analyze data in R, and
4. Hypothesize alternative factors that may influence changes in avian communities following natural disturbance.

Teaching Setting:

This module is designed for upper level biology or environmental science majors. It can be implemented in lab or lecture courses during two 3-hour class periods or spread out across three shorter class periods.

Citation:

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Related Materials and Opportunities:

The author of this resource developed this module while participating in the 2018 [NEON Data Education Fellows Faculty Mentoring Network \(FMN\)](#). [F](#) are online professional development opportunities that provide support and

guidance to educators before, during, and after implementation of a new teaching module or technique. NEON sponsors NEON Data Education Fellows (FMNs) each fall and spring semester to support faculty using NEON data in the classroom. Applications are now open for their Spring 2020 FMN.



Interested in adding quantitative reasoning and ecological data to your classroom? Join the NEON Data Education Fellows (FMN) to implement existing educational materials using data from the National Ecological Observatory Network (NEON). Topics range from plant phenology to earth-atmosphere gas exchange to ecological disturbance. Already teaching with NEON data? Join the FMN to share your education resource with others and prepare it for publication. Visit <https://qubeshub.org/community/groups/neon2018>

Other [Spring 2020 FMNs](#) include:

- [Data in Introductory Biological Sciences \(DIBS\) FMN](#)
- [ESA Data Access FMN—Inclusive Pedagogy](#)
- [HHMI BioInteractive Data Explorer FMN](#)
- [Molecular Case Studies FMN: At the Interface of Biology and Chemistry](#)
- [Exploring Universal Design for Learning with BIOMAAP FMN](#)

- [Make Teaching with R in Undergraduate Biology Less Excruciating \(M TRUBLE\)](#)

Application deadlines are rapidly approaching for the Spring 2020 FMNs, so apply now!

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Testing hypotheses about the role of wildfire in structuring avian communities

By Lesley Bulluck
Dept of Biology and Center for Environmental Studies

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