

Spectral Ecology Summer School Syllabus

2023 - 2024

1 General Information

1.1 Description

The Spectral Ecology Summer School (**SPEC School**) introduces participants to concepts in ecological remote sensing and inclusive leadership. The main foci are on using airborne remote sensing products from the National Ecological Observatory Network's Airborne Observation Platform (**NEON AOP**) and on building inclusive leadership skills for academia and beyond. The in-person component of the course, held at the University of Virginia's Mountain Lake Biological Station (**MLBS**) emphasizes field data collection, group leadership activities, and research projects, while lectures and discussions are held online in the months leading up to the field week.

1.2 Learning Objectives

- Understand the range of data products available from NEON.
- Access NEON data products via API and perform analyses in R.
- Collect leaves from the top of a forest canopy using various field tools.
- Collect and analyze leaf spectra.
- Analyze airborne hyperspectral and lidar data to address self-generated research questions.
- Use basic unix commands to navigate a shared computing environment.
- Use Git and Github for version control and collaborative code development.
- Examine how diversity, equity, inclusion, and justice (**DEIJ**) are addressed in academia.
- Practice and reflect on tough conversations through role playing.
- Value the importance of community in scientific research and practice collaborative science.

2 Course Policies

2.1 Communication

We will primarily use email for communication between SPEC School participants and MSU folks. If you have a question for Kyla or Adriana, including [SPEC School] in your subject line will help us respond to your emails faster.

We also have a SPEC School discord server which will include last year's participants, this year's, and future years, to help build an ecological remote sensing community. Use of the discord server is not required, but is a fast and easy way to communicate.

2.2 Course Platforms & Structure

Most communications and materials for this course will be shared via GoogleDrive and MSU's High Performance Computer Center (**HPCC**). HPCC access and a tutorial will be provided in the first months of SPEC School.

SPEC School will meet virtually via Zoom from March to June on the first Friday of each month from noon to 3 pm Eastern Time. The week prior to the in-person week we will meet virtually Monday through Thursday from noon to 3 pm Eastern Time. For the in-person week, most participants will travel to the Roanoke-Blacksburg Regional Airport (**ROA**) on Sunday and arrive at MLBS in the afternoon (we will pick folks up from ROA in vans), and depart MLBS the following Saturday in the morning. During the in-person week scheduled activities will take place from 8 am to 8 or 9 pm, with some downtime included in each day.

In between the virtual meetings, Adriana will hold office hours on discord, and both Kyla and Adriana will be available for questions via email.

2.3 Diversity

To learn we must be open to the views of people different than ourselves. Each and every voice in SPEC School is important and brings with it a wealth of experiences, values and beliefs. In this time we share together, please honor the uniqueness of your fellow participants and appreciate the opportunity we have to learn from each other. Please respect your fellow participants' opinions and refrain from personal attacks or demeaning comments of any kind. In the first SPEC School virtual meeting we will co-develop a code of conduct.

2.4 Attendance & Participation

We recognize that not everyone will be able to participate in all of the meetings, as sometimes conflicts arise. However, participation in the in-person week is required for SPEC School participants and participation in the virtual sessions is highly recommended. Potential applicants should not apply if they anticipate missing more than one or two of the virtual sessions.

2.5 Safety & Emergencies

In the event of an emergency, our primary goal will be to stay safe. There is a wide variety of situations we could potentially face as a group, so please be prepared to stay calm, and never hesitate to interrupt the instructors if something seems awry or dangerous.

During our field week small field first aid kits will be provided and a safety briefing will precede any work in the field. If you ever feel that something is unsafe, make sure to tell Kyla, Adriana, or one of the MLBS staff as soon as possible.

3 Other Resources & a Note

3.1 Support at MSU

As a member of SPEC School you are considered a guest of MSU and therefore have access to many MSU resources. Being a graduate student or postdoc comes with many opportunities and challenges, especially now. Here are some of the resources MSU has available online to help you maximize the opportunities and address the challenges.

Office of the University Ombudsperson - <http://ombud.msu.edu/> - If you have an issue (like with an MSU employee) and do not feel comfortable trying to resolve it with the person, the Ombuds Office can offer you advice.

MSU Office for Civil Rights and Title IX Education and Compliance - <https://civilrights.msu.edu/> - If you have questions about discrimination or harassment, this is a good place to look for resources.

MSU Counseling & Psychiatric Services - <https://caps.msu.edu/> - Free! Connect virtually via the website.

3.2 Confidentiality

Participants should be aware that MSU employees, including instructors, may not be able to maintain confidentiality when it conflicts with their responsibility to report certain issues based on external legal obligations or that relate to the health and safety of MSU community members and others. All your instructors must report the following information to other MSU offices if you share it:

- Suspected child abuse/neglect, even if this maltreatment happened when you were a child,

- Allegations of sexual assault or sexual harassment when they involve MSU students, faculty, or staff, and
- Credible threats of harm to oneself or to others.

These reports may trigger contact from a campus official who will want to talk with you about the incident that you have shared. In almost all cases, it will be your decision whether you wish to speak with that individual. If you would like to talk about these events in a more confidential setting you are encouraged to make an appointment with MSU Counseling & Psychiatric Services.

4 Assessment

There are no grades in SPEC School, but your feedback is essential to improve future courses and demonstrate SPEC School’s effectiveness to our funders. To that end there will be multiple assessments throughout SPEC School where you can share your thoughts, opinions, and experiences. We will have a pre-course survey, a mid-course survey, a post-course survey, and a long-term survey. Your participation in these surveys is essential to the long-term success of SPEC School so we really appreciate the time and effort you put into them.

5 Course Schedule

The following schedule remains subject to change and last-minute modifications.

Month	Topic	Pre-Meeting Reading	Pre-Meeting Activity
February	Pre-Course Assessment (no meeting)	Airborne RS papers	
March	Introductions, RS intro lecture, logistics, group code of conduct	Draft Code of Conduct, Decolonizing Ecology, Data Management	Assessment
April	Team Science, Professional Websites in GitHub, NEON introduction	GitHub intro, NEON Design	Intro to R, GitHub setup
May	R raster analysis lab, discussion of personality tests & mentorship, travel logistics, HPCC	Mentorship, Traits paper, MLBS info	Spectroscopy lab, Personality Test
June	Project brainstorming, survival scenario brainstorming, data needs & management	Gifts of Imperfection, NEON research	Leadership Ted Talks
June Virtual Week	Data & project planning, GitHub, DEI statements, logistics, and more!	DEI statement info, NEON research	Connecting GitHub to RStudio & NEON data access tutorial.
June in-person Week	Field data collection & NEON tower climb (weather permitting), PLSR, leaf processing, role playing, projects, NEON tour, etc.	As needed for research ideas.	Brainstorm research projects & explore data.
Post-Course	Surveys!		