

Ecology & Remote Sensing – Foliar Chemistry Internship (Summer 2017)

The chemical composition of canopy foliage mediates key ecosystem processes including productivity, herbivory and nutrient export. However, temporally and spatially extensive datasets that can reveal change in canopy foliar traits in response to environmental drivers are scarce. Advances in hyperspectral remote sensing have greatly enhanced our ability to measure canopy reflectance over large areas, and a better understanding of links between observed reflectance and measured foliar parameters will improve our ability to map unsampled regions and predict foliar chemical change over time.

In 2016, three linked ground-aerial campaigns were conducted across NEON, with airborne reflectance and canopy physio-chemical data both collected. The foliar analysis intern will use these data to investigate linkages between remotely sensed data products and foliar biophysical parameters across diverse ecosystems.

Essential Duties

- Summarize and explore site-level and cross-site patterns of foliar physio-chemical properties. Statistically analyze uncertainty for different vegetation types and locations.
- Use foliar physio-chemical data in conjunction with hyperspectral remote sensing measurements to generate models linking spectral data and measured foliar traits. Validate models using a subset of the data.
- Generate maps of foliar traits using NEON airborne data to scale up.
- If time allows, compare outputs from models to standard vegetation indices and assess how they compare.

Reports and Presentations

- Present project status to NEON mentor, departmental team and peers for feedback periodically throughout the summer.
- Prepare brief report describing project outcomes.
- Generate maps of foliar traits over NEON sites
- Present technical poster showcasing internship project to NEON team and to peers at final Intern Poster Session at end of the summer program.

Seminars and Departmental Meetings

Participate in technical and career seminars and meetings with NEON science staff, NEON Internship program staff, and peers.

Community and Professional Behavior

Interns are part of a diverse community of peers working and living together. Interns are expected to contribute positively to the community and to conduct themselves in a manner appropriate to a professional environment. Interns are also expected to fully participate during normal office hours and during NEON Internship functions.

Decision making and problem solving

Interns will use basic problem solving skills in their work, will exercise judgment regarding when to ask for help, and will consult with their supervisor or mentor on larger job or community related issues.

Education and Experience

Required

Currently enrolled in a community college or undergraduate biology, ecology or earth science program. Must have taken at least one introductory course in biology, ecology, or environmental science. Must have a least one semester of undergraduate education remaining after the summer program.

Desired (but not required)

Some experience with programming (R, Matlab, Python, IDL), as well as basic skills in organizing and manipulating data in spreadsheet form.

Knowledge/Skills/Abilities

- Ability to work full-time in Boulder, CO during the summer program.
- Ability to interact with mentors and peers in a manner that supports collaboration and inquiry.
- Ability and willingness to work within guidelines and policies of the organization and assigned work groups.

Tangible skills the intern will acquire:

- Data analysis in R
- Remote sensing data analysis and map production using a combination of R, ArcGIS, and ENVI

Other Requirements

You must have permanent authorization for US employment. Battelle Ecology, Inc. will not provide any kind of visa sponsorship