Forest recovery within mosaics of fire, drought, and insect outbreak in the Southern Rockies using high resolution drone and field surveys

Earth Lab seeks to hire two part-time undergraduate research assistants to help with post-fire forest recovery research in Summer Session 2022. Through participation in this project, you will gain skills in field experiment design and data collection to answer critical ecological questions.

For this project, you will join an Earth Lab team visiting a few selected sites in Colorado to collect field vegetation data as well as high-resolution natural color and multispectral images via uncrewed aerial system (UAS, drone). Pre-field training will be provided.

Project description & objectives
Disturbances such as wildfires, droughts, insect outbreaks, and climate warming are responsible for 6.3 billion dead trees across millions of acres of forests in the western US. A critical ecological question is whether these dead forests recover into their previous forest type after a single disturbance or mosaic of disturbance events (called compound disturbance). Satellite observations are widely used to map forest transitions at regional scale. However, coarse satellite observations (30 m – 1 km) cannot capture finer scale (meters) vegetation dynamics. It is important to link and validate those satellite observations using high resolution (~5-cm) remote sensing techniques (e.g., Uncrewed Aerial Surveys (UAS)) and field inventories which provide information of individual trees. The primary objective of this project is to collect information on dead and live tree spatial distribution and other types of vegetation cover (grass, herbs, shrubs) to model forest state transition after disturbance/s in the Southern Rockies during 1984-2020.

Tasks to be performed
- Serve as a visual observer for uncrewed aerial system (drone) flights
- Collect field data, such as tree inventories, using global positioning systems (GPS), clinometers, and tapes
- Digitize and map field observations using geospatial software

Minimum qualifications
- Current undergraduate student at CU Boulder
- Willingness to learn new techniques and work in outdoor environments

Preferred qualifications
- Experience with geospatial software such as QGIS or ArcGIS
- Experience with environmental fieldwork equipment and protocols, such as transects and tree tagging
- Experience with R and/or Python

Time commitment and compensation
- URA's will work 98 hours during the 2.5-month time period between 6/15/22 and 8/15/22
- Pay rate: $15/hour

Field plan *(may be adjusted depending on snowmelt timing)*
- June 15 – July 1: Field data collection planning and pre-field training of field instrument usage and UAS visual observer duties
- July 1 – August 15: Conduct UAS and tree allometry collections from the selected sites
- August 1 – August 15: Data preprocessing (QA/QC) and report writing

If you are interested in this position, please send a copy of your resume to Nayani Ilangakoon (ginikanda.ilangakoon@colorado.edu) and Tyler McIntosh (Tyler.L.Mcintosh@colorado.edu) by May 15.