

UAV (Drone) Remote Sensing of Post-Fire Watershed Impacts

Faculty mentor name, department, college, and contact information

- **Peter Nelson**, Associate Professor, Dept. of Civil and Environmental Engineering, Walter Scott College of Engineering, 970-491-5247, peter.nelson@colostate.edu
- **Christopher Robertson**, CSU Drone Center, Walter Scott College of Engineering, Engineering Research Center A318, 970-491-8985, christopher.robertson@colostate.edu

Are there any other identified mentors (e.g. field-based Extension agent) associated with this project?

- **Mark Platten**, Director and Extension Agent Natural Resources, Teller County, 719-686-7961, mark.platten@colostate.edu
- **Sophia Linn**, CSU Geospatial Centroid, 211G Morgan Library, 970-491-2774, Sophia.linn@colostate.edu

Please describe the mentor's role/contribution to this internship.

The mentor will meet weekly with the student to provide guidance on data acquisition planning, data processing, and data analysis. The mentor will also connect the intern with groups conducting post-fire research and facilitate collaborations.

In what region(s) will the student be working (county/region)?

Larimer County and Grand County, Colorado. The student will be working in the areas burned in the 2020 Cameron Peak and East Troublesome wildfires. When not conducting fieldwork, the student will work out of the Engineering Research Center on the Foothills Campus.

Please describe the proposed internship goals, scope, and objectives.

The goal of this internship is to gain valuable experience supporting research into the impacts of the Cameron Peak and East Troublesome wildfires. Both fires occurred in 2020 and are the two largest fires in Colorado history. The primary objective will be to use UAVs (drones) to collect aerial imagery of fire affected areas and subsequently build orthomosaic images and digital elevation models (DEMs) to quantify the impact of the fire. Particular focus will be given to areas where data were collected by 2021 Summer Extension Interns, as 2021 and 2022 data will be used to quantitatively evaluate changes in topography (erosion/deposition) and vegetation recovery. The intern/research team will work with the CSU Geospatial Centroid to make these finished map products available to the public for further access and analysis of the wildfire's impact.

The student will learn to operate UAVs via participation in one of the CSU Drone Center's flight schools, and become a FAA certified sUAS pilot. The student will learn flight and data collection techniques. The student will learn to use specialized software to create 2D and 3D georeferenced maps and models. Collectively, this skill set is highly sought after by employers in many fields, as UAV use is critical in many fields/applications.

How do the learning outcomes align with the goals of engagement and extension?

UAVs are increasingly being used to understand wildfire impacts, develop plans for post-fire restoration, and evaluate post-fire management and recovery. The skills and knowledge the student will acquire during this internship will provide research-based information on how the Cameron Peak and East Troublesome fires, as well as mulching efforts conducted after the fire, have impacted natural resources and the community.

Are travel funds available? Opportunities to provide student assistance with housing?

Some funds may be available for mileage to field sites. Funding may be available for housing in Grand County if overnight trips to the East Troublesome Fire are needed.