**Facilities, Equipment, and Other Resources**

**Laboratory: University of Idaho Fire Combustion Laboratory (Smith)**

The Idaho Fire Initiative for Research and Education (IFIRE) combustion laboratory is directed by PI Smith. The IFIRE lab has enough space for multiple people to work at the same time and is located just outside of the Moscow, Idaho, city limits. There is a preparation and control room and a separate combustion chamber within climatically controlled room containing a dedicated fume hood (with multiple speed settings).

Major Equipment: IFIRE is equipped with three dual-band infrared radiometers (0.2-9.0 mm, 5.5-15 mm) developed at Rochester Institute of Technology. IFIRE uses 3 dedicated PCs to directly log the radiometer as well as gas analysis, mass loss, and videography data. IFIRE also has an additional 10 thermal radiometer towers used in field scaling experiments. The radiometers employ a dual-detector infrared thermopile and during operation, dry air is streamed across the detector surface to reduce fouling from soot and other smoke particulates. The ambient temperature of the infrared thermopile is measured using a digital thermometer. The dual-band infrared radiometer has a 52° instrument field of view and is typically positioned at a fixed height of 1.16m at nadir above the center of a 1 m2 circular fuel bed.

Fuels are combusted on a custom burn table consisting of kiln bricks sitting on five 1.0 metric ton capacity steel tables that can be used to create up to 5x2 m fuel beds. Smaller fuel beds are burnt on a low conductance rigid concrete board that rests on top of a Sartorius EB Series scale (65kg capacity, accurate to 1g), which can be synchronized with a dual-band radiometer to record fuel mass loss throughout the burn period. IFIRE is also equipped with four Lascar Electronics EL-USB-CO300 CO analyzers, a Thermo Scientific NO-NO2-NOx chemiluminescence analyzer, two Thermo Scientific PDR 1500 nephelometers, and a LiCOR CO2-H2O analyzer that via accompanying flow rate meters can also be synchronized with a radiometer. IFIRE includes 5 high definition digital video cameras and type K thermocouples of varying size to enable fire behavior measurements (rate of spread, burn duration, flame heights, fuel bed and plume temperatures). IFIRE houses a full range ASD field spectroradiometer (0.35-2.5 mm) with a series of different field of view fiber optics. IFIRE has a Decagon KD-2 Pro and a WP4-T to assess conductivity and soil water potential. IFIRE can measure spectra either with an ASD PlantProbe or within an onsite darkroom with a full spectrum 1000W photographer’s lamp. IFIRE conditions fuels using four UV lamps, a 0.23 m3 10-95% relative humidity climate chamber, and two 0.45 m3 drying ovens, an 11.3 m3 walk in freezer that has humidity control as well as access to a 37.2 m2 onsite fog room. IFIRE has several precision balances, a muffle furnace, and a full set of chemical analysis and vegetation sampling equipment. IFIRE also maintains a large collection of forest mensuration and environmental equipment, including tapes, rangefinders, vegetation pruners, soils probes and cores, soil sieves, lysimeters, a Topcon total station, Decagon leaf wetness sensors, and infiltrometers.

Office: Space is provided for graduate students and postdoctoral fellows as needed within the College of Natural Resources.

Other resources: Adjacent to IFIRE, the University of Idaho Center for Forest Nursery and Seedling Research has several large greenhouses and other facilities capable of growing plants (grasses, shrubs, and trees) from around the world. Within the College of Natural Resources we have access to a fully outfitted plant physiological ecology lab that has gas exchange equipment (one LICOR 6400XT and access to 3 other departmental 6400s), dataloggers and sensors, water potential measuring equipment (e.g, pressure chambers and psychrometers), and elemental analyzers.