Soil Carbon Storage and Fungal Diversity in Post-Fire Douglas-Fir Ecosystems: Strategies for Protection and Recovery

Wildfires continue to pose significant threats to carbon stocks and ecosystem functioning in forests across the province. In temperate forests, belowground carbon accounts for approximately half of the total carbon budget, with fungal communities playing a critical role in regulating carbon flows between the soil and atmosphere. Wildfire impacts on fungal communities and soil carbon, however, vary across fire severity gradients. Low-severity wildfires tend to have minimal effects on soil carbon while preserving the functional diversity of fungi. Thinning, which mimics the effects of low-severity fire, can reduce wildfire risk and promote soil carbon storage, particularly in overstocked Douglas-fir forests at the forest-grassland ecotone. In contrast, soil carbon recovery from high-severity wildfires in these dry forests remains a significant challenge, as site preparation techniques intended to facilitate recovery can exacerbate post-fire soil carbon losses. This seminar will explore the impacts of wildfire on soil carbon and fungal communities across fire severity gradients, the stability of soil carbon in forest-grassland transitions, and the effects of site preparation on soil carbon and seedling mortality in Douglas-fir forests