

Post-Doctoral Research Associate Position in Forest Fire Science

University of Northern British Columbia, Prince George, British Columbia, Canada

Job Description: A well-qualified researcher is sought to work as part of a multi-institutional research program trying to understand and predict wildfire behavior in the spruce, pine, and aspen dominated forests of central British Columbia. Large wildfires burned 2.5 million hectares in British Columbia in 2017 and 2018, exhibiting a wide range of fire behavior, burn severity, and fire skips from which we hope to learn how to promote fire resilience in forest landscapes.

Research will involve three main components:

- 1) Retrospective analysis of burn severity in numerous wildfires from previous years based on satellite imagery, assessed with respect to the influence of terrain, pre-burn forest inventory mapping, silvicultural history, and daily fire weather data;
 - For example, why are conifer plantations sometimes skipped by large landscape fires? Do aspen stands slow or stop fire spread?
- 2) Field sampling to verify and calibrate satellite-based burn severity measurements, with paired sampling of unburned locations within the same or analogous forest inventory polygons;
 - For example, are different dNBR thresholds needed to interpret burn severity in aspen stands than for conifer stands?
- 3) Exercising existing spatially explicit forest landscape simulation models or fire behavior models to test the ability of different spatial arrangements of tree species, stand ages, stand densities and other variables for their ability to constrain fire severity and spread.
 - For example, under what circumstances will aspen stands or managed stands of different ages slow or stop a landscape fire? How wide must such buffers be to cope with different fire weather conditions?

Responsibilities will include:

- Acquisition and geographic information system (GIS) manipulation of Landsat and Sentinel remote sensing data, BC Vegetation Resource Inventory (VRI) data, BC RESULTS (Reporting Silviculture Updates and Land Status Tracking System) data, and interpolation of Fire Weather Index (FWI) components from multiple weather station data.
- Conducting several weeks of field sampling in multiple locations in central British Columbia, following standard protocols being used by collaborators; work requires resource road driving and 2-way radio communications, navigating and walking long distances in burned and unburned forest, and supervision of a field assistant, with constant attention to safety.
- Implementing and calibrating generic spatial landscape models such as SELES or LANDIS, and/or fire behavior models such as Prometheus and BurnP3, so they can be exercised repeatedly in a stochastic manner on real (GIS-informed) landscapes of central B.C., and on hypothetical modifications to the forest composition and structure of those landscapes.
- Statistical analysis of variables predictive of burn severity, corrected for spatial autocorrelation as appropriate, and of multiple simulation model scenarios; writing up and interpreting the results of this work, and relating it to similar work in the published literature.
- Synthesis of those results and interpretations in the form of presentations directed to scientific, professional and public presentations; preparation of manuscripts for submission to peer-reviewed scientific journals;

- Regular communication and collaboration with the Principal Investigator, collaborators at other universities and research institutes, and in Provincial and Federal research and land management agencies.

Qualifications:

- A recent Ph.D. in forestry, forest ecology, geography or similar environmental science;
- Experience and expertise with remote sensing, GIS (including ArcMap) and statistical analysis software (preferably R);
- Experience with, or willingness to learn, the use of spatially explicit models of landscape dynamics or wildfire behavior;
- Ability to work independently with strong self-motivation, while also taking responsibility for supervision of assistants and being eager to work collaboratively with other researchers and land managers.

Practical Details:

- This is an 18-month position, to start sometime between July 1 and October 1, 2020, pending final funding approval and budget supplements, and the relaxation of COVID-19 restrictions.
- This call for applications is directed to Canadian citizens and permanent residents, and to international applicants who qualify to immigrate to or work temporarily in Canada.
- This position may be based at the University of Northern British Columbia (www.unbc.ca) at either its Prince George or Terrace campus, or at the Bulkley Valley Research Centre (www.bvcentre.ca) in Smithers, BC. Stays of a week or more may be required in Victoria, BC, and Vancouver, BC, and of 2 to 6 weeks in the field.
- Field work may be conducted by daily travel from small-town motels or remote fishing lodges, or may involve tenting or use of a hard-top camper or trailer in remote locations with only satellite phone communications.
- Collaborative institutions and agencies include the University of Northern British Columbia, University of British Columbia, University of Alberta (to be confirmed), Bulkley Valley Research Centre, British Columbia Wildfire Service, the Lakes Resource District of the BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development, and the Pacific Forestry Centre of the Canadian Forest Service, Natural Resources Canada.
- Annual salary will be between CAD \$45,000 and CAD \$60,000, with benefits (vacation pay, supplemental medical and dental insurance, retirement savings contributions) yet to be determined on the basis of final budgets and the host institution chosen.
- This position will be mentored and supervised by Dr. Phil Burton, Professor, Ecosystem Science and Management, University of Northern British Columbia (Terrace Campus). For more information on his background, interests, and expertise, see:
 - <https://www.unbc.ca/people/burton-dr-phil>
 - https://www.researchgate.net/profile/Philip_Burton2
 - <https://scholar.google.ca/citations?user=p2lea64AAAAJ&hl=en&oi=sra>
 - <https://www.linkedin.com/in/phil-burton-68624b90/?originalSubdomain=ca>
- If interested, please send a complete curriculum vita (c.v.) and cover letter outlining how you are well qualified to undertake the work described above. To apply, or to request additional information, please e-mail phil.burton@unbc.ca.