

CURRICULUM VITAE

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Education

Ph.D. 2004 Forestry, University of Toronto
Title: Predicting forest fire occurrence in the province of Ontario

B.Sc.H. 1990 Physics, Queen's University at Kingston

Professional employment history

Senior Research Scientist Forest Fire Behaviour and Climate Change, Great Lakes Forest Centre, Canadian Forest Service. 2017-

Research Scientist Forest fire behaviour and climate change, Great Lakes Forest Centre, Canadian Forest Service. 2005-2017

Physical Scientist Forest fire behaviour and climate change. Great Lakes Forest Centre, Canadian Forest Service, Canadian Forest Service 1996-2005

Physical Scientist Forest fire behaviour and ecology. Petawawa National Forestry Institute, Canadian Forest Service, Canadian Forest Service 1990-1996

Research areas

Dr. Wotton's current research focus involves developing process based models of fuel moisture exchange, fire ignition and spread that can be applied by fire management agencies throughout Canada. This work, in part, involves development of models for the Canadian Forest Service's Canadian Forest Fire Danger Rating System (CFFDRS), a system used operationally throughout Canada and a growing number of countries around the world. His research has also focused on the projection of climate change impacts on fire activity and management in Canada using of fire danger and fire occurrence models. Dr. Wotton works closely with fire management agencies from across Canada in the application of the results of his research and the CFFDRS into daily fire management operations.

Training Activities

Dr Wotton is stationed at the University of Toronto, within the Faculty of Forestry, where (as a status-only professor) he supervises graduate students interested in the physical aspects of forest fire science, serves on graduate advisory committees of graduate students studying forestry, teaches a course he developed on fire danger rating and fire behaviour to both undergraduate and graduate students (FOR419/1416), and guest lectures in other undergraduate and graduate level classes.

Selected Professional activity

- Co-Chair of the Wildland Fire Canada 2019 Conference
- Canadian Chair and Canadian delegation led for North American Forestry Commission-Fire Management Working Group (2017-2019)
- Associate Editor - Canadian Journal of Forest Research (2017-2019)
- Chair of International Union of Forest Research Organizations (IUFRO) Forest Fire Unit (2015-2020)
- National representative on Western Centre for Wildland Fire Research Advisory Committee (University of Alberta) (2010-2012)
- Member of scientific advisory committee – VIth International Conference on Forest Fire Research (2010,2014,2018,2022)
- Conference co-chair and Program Chair – Wildland Fire Canada 2010
- Wildland Fire Canada Conference series co-founder 2010
- Coordinator of Canadian Forest Service’s Modernization of the Canadian Forest Fire Danger Rating System research program.(2009-present)
- Chair and member of the International Association of Wildland Fire’s Graduate Scholarship Committee (2008 to 2013)
- Adjunct professor in the Faculty of Forestry, University of Toronto (2006-present)
- Associate Editor of the International Journal of Wildland Fire (2000 to 2010)
- Canadian Forest Service’s representative on the Canadian Interagency Forest Fire Committee Science and Technology Working Group. (2004-2007)
- Member of the Canadian Council of Forest Minister’s Core Team developing the Canadian Wildland Fire Strategy (2004-2006)

Scientific Journal Publications

- Wheatley M, Wotton BM, Woolford DG, Martell DL, Johnston JM (2023). Modelling decisions concerning the dispatch of airtankers for initial attack on forest fires in Ontario, Canada. *Canadian Journal of Forest Research*.
<https://doi.org/10.1139/cjfr-2022-0225>
- Moris JV, Álvarez-Álvarez P, Conedera M, Dorph A, Hessilt TD, Hunt HGP, Libonati, R., Menezes, L. S., Müller, M. M., Pérez-Invernón, F. J., Pezzatti, G. B., Pineda, N., Scholten, R. C., Veraverbeke, S., Wotton, B. M., and Ascoli, D. (2023) A global database on holdover time of lightning-ignited wildfires, *Earth Syst. Sci. Data Discuss.* [preprint], <https://doi.org/10.5194/essd-2022-410>
- McFayden CB, George C, Johnston LM, Wotton BM; Johnston D, Johnston JM. (2022) A Case-study of Wildland Fire Management Knowledge Exchange: The Barriers and Facilitators in the Development and Integration of the Canadian Forest Fire Danger Rating System in Ontario, Canada. *International Journal of Wildland Fire* 31(9)
- Wheatley M, Wotton BM, Woolford DG, Martell DL, Johnston JM (2022) Modelling initial attack success on wildfires supported by air attack in Ontario, Canada. *International J. Wildland Fire* 31(8).

- Hanes CC, Wotton M, Woolford DG, Martell DL Flannigan MD (2022) Mapping organic layer thickness and fuel load of the boreal forest in Alberta, Canada. *Geoderma* 417: 115827.
- Boyчук D, McFayden CB, Woolford DG, Wotton M, Stacey A, Evens J, ... & Wheatley, M. (2021). Considerations for Categorizing and Visualizing Numerical Information: A Case Study of Fire Occurrence Prediction Models in the Province of Ontario, Canada. *Fire*, 4(3), 50.
- Dufour D, Le Noc L, Tremblay B, Tremblay MN, Généreux F, Terroux M, Vachon C, Wheatley MJ, Johnston JM, Wotton M and Topart P (2021) A bi-spectral microbolometer sensor for wildfire measurement. *Sensors*, 21(11), p.3690.
- Wilkinson SL, Furukawa AK, Wotton BM, Waddington JM (2021). Mapping smouldering fire potential in boreal peatlands and assessing interactions with the wildland–human interface in Alberta, Canada. *International Journal of Wildland Fire*, 30(7), 552-563.
- Lin Z, Bohdenoc D, Liu HHT, Wotton M (2021) Autonomous Wildfire Hotspot Detection Using a Fixed Wing UAV. *Int J Aerospace System Science and Engineering* 1(1)
- Woolford DG, Martell DL, McFayden C, Evens J, Stacey A, Wotton BM, and Boyчук, D (2020). The Development and Implementation of a Human-Caused Wildland Fire Occurrence Prediction System for the Province of Ontario, Canada. *Canadian Journal of Forest Research*, 51 (2), 303-325
- Coogan SC, Daniels LD, Boyчук D, Burton PJ, Flannigan MD, Gauthier S, Kafka V, Park JS, Wotton BM. (2021) Fifty years of wildland fire science in Canada. *Canadian Journal of Forest Research*. 51(2):283-302.
- Hanes C, Wotton M, Woolford DG, Martell DL, Flannigan M (2020) Preceding Fall Drought Conditions and Overwinter Precipitation Effects on Spring Wildland Fire Activity in Canada. *Fire*, 3(2), 24.
- Pepin AC, Wotton M (2020) Fire Behaviour Observation in Shrublands in Nova Scotia, Canada and Assessment of Aids to Operational Fire Behaviour Prediction. *Fire*, 3(3), 34.
- Boyчук D, McFayden CB, Evens J, Shields J, Stacey A, Woolford DG, Wotton M, Johnston D, Leonard D, McLarty D (2020). Assembling and Customizing Multiple Fire Weather Forecasts for Burn Probability and Other Fire Management Applications in Ontario, Canada. *Fire*, 3(2), 16.
- Johnston LM, Wang X, Erni S, Taylor SW, McFayden CB, Oliver JA, Stockdale C, Christianson A, Boulanger Y, Gauthier S, Arseneault D, Wotton BM, Parisien M, Flannigan MD, (2020). Wildland fire risk research in Canada. *Environmental Reviews*, 28(2), 164-186.
- Lin Z, Liu HHT, Wotton M (2018) Kalman filter-based large-scale wildfire monitoring with a system of UAVs. *IEEE Transactions on Industrial Electronics* [10.1109/TIE.2018.2823658](https://doi.org/10.1109/TIE.2018.2823658)
- Wilkinson SL, Moore PA, Thompson DK, Wotton BM, Hvenegaard S, Schroeder D, Waddington JM (2018). The effects of black spruce fuel management on surface fuel condition and peat burn severity in an experimental fire. *Canadian Journal of Forest Research*, 48(12), 1433-1440.

- Wilkinson, S. L., Moore, P. A., Flannigan, M. D., Wotton, B. M., & Waddington, J. M. (2018). Did enhanced afforestation cause high severity peat burn in the Fort McMurray Horse River wildfire? *Environmental Research Letters*, 13(1), 014018.
- Daniel, C. J., Ter-Mikaelian, M. T., Wotton, B. M., Rayfield, B., & Fortin, M. J. (2017). Incorporating uncertainty into forest management planning: Timber harvest, wildfire and climate change in the boreal forest. *Forest ecology and management*, 400, 542-554.
- Wotton BM, Flannigan MD, Marshall GA (2017). Potential climate change impacts on fire intensity and key wildfire suppression thresholds in Canada. *Environmental Research Letters*, 12(9), 095003.
- Wang X, Wotton M, Cantin A, Parisien M, Anderson K, Moore B, Flannigan M. (2017) cffdrs: An R package for the Canadian Forest Fire Danger Rating System. *Ecological Processes* 6(1)
- Aponte C, de Groot WJ, & Wotton BM (2016). Forest fires and climate change: causes, consequences and management options. *International Journal of Wildland Fire*, 25(8), i-ii.
- James, P., Robert, L. E., Wotton, B. M., Martell, D. L., & Fleming, R. A. (2017). Lagged cumulative spruce budworm defoliation affects the risk of fire ignition in Ontario, Canada. *Ecological applications*, 27(2), 532-544.
- Thompson D, Schiks TJ, Wotton BM (2016) Fuel size impacts on carbon residuals and combustion dynamics in masticated woody debris. *Forest Ecology and Management* 369, 59-65.
- Schiks TJ, Wotton BM, Turetsky MR, Benscotter BW (2016) Variation in fuel structure in boreal fens. *Canadian Journal of Forest Research* 46(5), 683-695.
- Flannigan MD, Wotton BM, Marshall GA, de Groot WJ, Johnston J, Jurko N (2016) Fuel moisture sensitivity to temperature and precipitation; Climate change implications. *Climatic Change* 134(1-2), 59-71.
- Kidnie S and Wotton BM (2015) Characterization of the Fuel and Fire Environment in Southern Ontario's Tallgrass Prairie. *International Journal of Wildland Fire* 24(8), 1118-1128.
- Thompson D, Studens J, Krezek-Hanes C, Wotton BM (2015) The impact of root exclusion on duff moisture and fire danger. *Canadian J. Forest Research* 45(8) 978-986
- Johnston D.C., Turetsky M.R., Benscotter, B.W. and Wotton B.M. (2015) Fuel load, structure and fire behaviour in forested boreal bogs. *Canadian Journal of Forest Research* 45(7) 888-899
- Schiks, T., Thompson, D, Wotton, BM, (2015) Short-term effects of mastication on fuel moisture and thermal regime of boreal fuel beds. *Canadian J Forest Research* 45(7):867-876
- Lukenbach MC , Hokanson KJ, Devito KJ, Kettridge N, Thompson DK, Moore PA, Wotton BM, Petrone RM, Waddington JM (2015) Hydrological controls on deep burning in a northern forested peatland. *Hydrological Processes* DOI:10.1002/hyp.10440.
- Kettridge, N., Turetsky, M. R., Sherwood, J. H., Thompson, D. K., Miller, C. A., Benscotter, B. W., Flannigan M.D, Wotton, B.M. Waddington, J. M. (2015).

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- Thompson D, Wotton M, Waddington M (2015) Heat transfer and the initiation of organic soil combustion during wildfire in forested wetlands. *International J Wildland Fire* DOI:10.1071/WF12121
- Schiks T, Wotton BM (2014) Modifying the Canadian Fine Fuel Moisture Code for masticated surface fuels. *International J. Wildland Fire* 25(1) 79-91 DOI: 10.1071/WF14041
- Schiks T, Wotton BM (2014) Assessing the probability of sustained flaming in masticated fuel beds. *Canadian Journal of Forest Research* 45(1) 68-77, doi: 10.1139/cjfr-2014-0294
- Woolford DG, Dean CB, Martell DL, Ji Guo C, Wotton BM. (2014) Lightning-caused Forest Fire Risk in Northwestern Ontario, Canada is Increasing and Associated with Anomalies in Fire-Weather. *Environmetrics* 25(6) 406-416. DOI: 10.1002/env.2278
- Plucinski MP, McCaw WL, Gould JS, Wotton BM. (2014) Predicting the number of daily human-caused bushfires to assist suppression planning in south-west Western Australia. *International Journal of Wildland Fire*. 23(4):520-31. DOI: 10.1071/WF13090
- Gould JS, Patriquin MN, Wang S McFarlane B, Wotton B (2013) Economic evaluation of research to improve the Canadian forest fire danger rating system. *Forestry*, 86 (3): 317-329. doi:10.1093/forestry/cps082
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- Savage, D., Wotton, B.M., Martell, D.L., and Woolford, D.G. (2012). The impact of uncertainty concerning historical burned area estimates on forest management planning. *Forest Science* 59(5) 578-588. DOI: 10.5849/forsci.11-081
- Linn R, Anderson K, Winterkamp J, Brooks A, Wotton M, Dupuy, J-L, Pimont F, Edminster C. (2012) Incorporating field wind data into FIRE-TEC simulations of the International Crown Fire Modeling Experiment (ICFME): preliminary lessons learned. *Canadian Journal Forest Research*.42(5):879-898
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- Wotton BM, Gould JS, McCaw WL, Cheney NP, Taylor SW (2012) Flame temperature and residence time of fires in dry eucalypt forest. *International Journal of Wildland Fire* 22(3) doi: 10.1071/WF10127.
- Podur J and Wotton BM (2011) Defining fire spread event days for fire growth modeling. *International Journal of Wildland* 20(4) 497-507
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- Savage DW, Martell DL, Wotton BM (2010) The Evaluation of Two Risk Mitigation Strategies for Dealing with Fire-Related Uncertainty in Timber Supply Modelling. *Canadian Journal of Forest Research* 40:1136-1154, doi10.1139/X10-065
- Podur, J and Wotton BM. (2010) Will climate change overwhelm fire management capacity? *Ecological Modelling* 221, 1301-1309
- Wotton BM, Nock CA, Flannigan MD. (2010) Forest Fire occurrence and climate change in Canada. *International Journal of Wildland Fire*. 19(3) 253-271.
- Weise DR, Wotton BM (2010) Wildland–urban interface fire behaviour and fire modelling in live fuels. *International Journal of Wildland Fire* 19(2), 149-152
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- Zhou, L., Braun J, Woolford D, Wotton BM. (2009) A Simulation Study of Predicting Flush Date. *Communications in Statistics - Simulation and Computation* 38(5): 1071-1082. DOI: 10.1080/03610910902785738
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- Girardin MP, Wotton BM (2009) Summer moisture and wildfire risks across Canada. *Journal of Applied Meteorology and Climatology*, 48: 517-533
doi:10.1175/2F2008JAMC1996.1
- Flannigan MD, Stocks BJ, Turetsky MR, Wotton BM (2008). Impact of climate change on fire activity and fire management in the circumboreal forest. *Global Change Biology* 14, DOI: 10.1111/j.1365-2486.2008.01660.x
- Wotton, B.M. and Beverly JL (2007). Stand specific litter moisture content calibrations for the Canadian Fine Fuel Moisture Code. *International Journal of Wildland Fire* 16(4):463-472
- Beverly J.L. and Wotton, B.M. 2007. Modelling the probability of sustained flaming: predictive value of fire weather index components compared with observations of site weather and fuel moisture conditions. *International Journal of Wildland Fire* 16(2):161-173.
- Flannigan, M.D., Amiro, B.D., Logan, K.A., Stocks, B.J., and Wotton B.M. 2005. Forest Fire and Climate Change in the 21st Century. Mitigation and Adaptation Strategies for Global Change. DIO: 10.1007/s11027-005-9020-7
- Wotton B.M. and Martell, D.L. 2005. A lightning fire occurrence model for Ontario. *Canadian Journal of Forest Research* 35(6): 1389-1401.
- Wotton, B.M., Stocks, B.J. and Martell, D.L. (2005). An index for tracking sheltered forest floor moisture within the Canadian Forest Fire Weather Index System. *International Journal of Wildland Fire* 13 (2): 169-182.

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- Taylor, S.W.; Wotton, B.M.; Alexander, M.E.; Dalrymple, G.N. 2004. Variation in wind and crown fire behaviour in a northern jack pine – black spruce forest. *Canadian Journal of Forest Research*, 34:1561-1576.
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- Wotton, B.M.; Martell, D.L.; Logan, K.A. 2003 Climate change and people-caused forest fire occurrence in Ontario. *Climatic Change*, 60: 275-295.
- Stocks, B.J.; Mason, J.A.; Todd, J.B.; Bosch, E.M.; Amiro, B.D.; Flannigan, M.D.; Martell, D.L.; Wotton, B.M.; Logan, K.A.; Hirsch, K.G. (2003) Large forest fires in Canada, 1959-1997. *J. Geophysical Research*. (D) 108, 8149, doi:10.1029/2001JD000484.
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Research Information Reports

- McFayden CB, Wotton BM, Robinson JW, Johnston JM, Cantin AS, Jurko NM Boucher J, Wheatley M, Ansell M, Boychuk D, Russo B (2023) Reference Guide to the Drop Effectiveness of Skimmer and Rotary Wing Airtankers. Natural Resources Canada, Canadian Forest Service, Great Lakes Forestry Centre. Information Report GLC-X-35. 181p.
- Hanes CC, Wotton BM, McFayden C, Jurko N (2021) An approach for defining physically based Fire Weather Index System classes for Ontario. Natural Resources Canada, Canadian Forest Service, Great Lakes Forestry Centre. Information Report GLC-X-29. 35p.
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- T.J. Schiks D.K. Thompson, S. Hvenegaard, D. Schroeder, and B.M. Wotton (2016). Mulch fuels in boreal forests: structure, moisture, and initial fire behaviour observations. Nat. Resour. Can., Can. For. Serv., North. For. Cent., Edmonton, Alberta. For. Manag. Note 66
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- Wotton, B.M.; Logan, K.A. and McAlpine, R.S. 2005. Climate change and the future fire environment in Ontario: fire occurrence and fire management impacts. Ontario Ministry of Natural Resources Climate Research Report CCR-01.32p.
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Theses

- Wotton, B.M. 2004. Predicting forest fire occurrence in Ontario. Ph.D. Thesis. University of Toronto.

Book chapters

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