Tristan RH **Goodbody**

Remote Sensing of Forests Specialist
University of British Columbia, Vancouver
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Experience

Post-Doctoral Fellow
Vancouver, BC

Faculty of Forest Resources Management (UBC)
June 2019 - Present

- Assessment of wood attributes using remote sensing (AWARE) & Canadian Wood Fibre Center Forest Innovation Program.
  - Mentor graduate students on remote sensing practices and routines
  - Developed lidar processing and analysis frameworks to enhance forest inventory knowledge
  - Developed a structurally guided sampling package sgsR
  - Collaborated with international govnerment, industry, and academic partners

Teaching assistant
Vancouver, BC

Faculty of Forest Resources Management (UBC)
May 2015 - March 2019

- Leading & supervising applied exercises to guide student knowledge of remote sensing concepts.
  - Guiding students to success in written and oral submissions
  - FRST 443 - Remote sensing for ecosystem management
  - FRST 521 - Advanced earth observation and image processing
  - Held weekly office hours, guest lectured, developed and graded assignments and research proposals

Planning Forester Intern - Co-op
Chetwynd, BC

Chetwynd Forest Industries - West Fraser Mills LTD.
May 2014 - December 2014

- Working in a team and individually to implement West Fraser Management objectives.
  - Site plan preparation
  - Harvest planning & layout
  - Silviculture assessments and reforestation quality inspections
  - post-fire salvage planning and management
  - GIS management
  - Forest appraisals

Planning Forester Intern - Co-op
Williams Lake, BC

Alex Fraser Research Forest (UBC)
May 2013 - September 2013

- Implemented planning and management perscriptions.
  - Road & timber layout
  - Timber cruising
  - Volume determination
  - Avian habitat assessments

Education

University of British Columbia
Vancouver, BC

PhD Remote Sensing of Forests
May 2015 - March 2019

- Assessing the role of digital aerial photogrammetry for characterizing forest structure and enhancing forest inventories

University of British Columbia
Vancouver, BC

BSc Natural Resources Conservation (Hons.& Co-op)
September 2010 - January 2015

- Science and Management Major.
  - Cons 330: Conservation Policy
  - FRST 443: Remote Sensing Of Ecosystem Management
  - CONS 451: Integrated Field School

Technical Skills

Project Management	Technical Writing	Data Analytics
Effective Planning, Organization, Communication, Implementation	Publications, Official Reports, Funding Grants	R, Management, Manipulation, Visualization, Interpretation

Awards

PhD Funding *Vancouver, BC*

NSERC PGSD *2018*

PhD Funding *Vancouver, BC*

Harry G. Smith Scholarship *2018*

Peer-Reviewed Publications

1. Goodbody, T. R., Coops, N. C., Srivastava, V., Parsons, B., Kearney, S. P., Rickbeil, G. J., & Stenhouse, G. B. (2021). Mapping recreation and tourism use across grizzly bear recovery areas using social network data and maximum entropy modelling. *Ecological Modelling*, *440*, 109377.
2. Toit, F. du, Coops, N. C., Goodbody, T. R., Stoehr, M., & El-Kassaby, Y. A. (2021). Deriving internal crown geometric features of douglas-fir from airborne laser scanning in a realized-gain trial. *Forestry: An International Journal of Forest Research*, *94*(3), 442–454.
3. Fu, X., Zhang, Z., Cao, L., Coops, N. C., Goodbody, T. R., Liu, H., Shen, X., & Wu, X. (2021). Assessment of approaches for monitoring forest structure dynamics using bi-temporal digital aerial photogrammetry point clouds. *Remote Sensing of Environment*, *255*, 112300.
4. Tompalski, P., Coops, N. C., White, J. C., Goodbody, T. R., Hennigar, C. R., Wulder, M. A., Socha, J., & Woods, M. E. (2021). Estimating changes in forest attributes and enhancing growth projections: A review of existing approaches and future directions using airborne 3D point cloud data (feb, 10.1007/s40725-021-00135-w, 2021). *Current Forestry Reports*, *7*(1), 25–30.
5. Tompalski, P., Coops, N. C., White, J. C., Goodbody, T. R., Hennigar, C. R., Wulder, M. A., Socha, J., & Woods, M. E. (2021). Publisher correction: Estimating changes in forest attributes and enhancing growth projections: A review of existing approaches and future directions using airborne 3D point cloud data. *Current Forestry Reports*, 1–6.
6. Coops, N. C., Tompalski, P., Goodbody, T. R., Queinnec, M., Luther, J. E., Bolton, D. K., White, J. C., Wulder, M. A., Lier, O. R. van, & Hermosilla, T. (2021). Modelling lidar-derived estimates of forest attributes over space and time: A review of approaches and future trends. *Remote Sensing of Environment*, *260*, 112477.
7. Kearney, S. P., Larsen, T. A., Goodbody, T. R., Coops, N. C., & Stenhouse, G. B. (2021). Characterizing off-highway road use with remote-sensing, social media and crowd-sourced data: An application to grizzly bear (ursus arctos) habitat. *Remote Sensing*, *13*(13), 2547.
8. Goodbody, T. R., Coops, N. C., Luther, J. E., Tompalski, P., Mulverhill, C., Frizzle, C., Fournier, R., Furze, S., & Herniman, S. (2021). Airborne laser scanning for quantifying criteria and indicators of sustainable forest management in canada. *Canadian Journal of Forest Research*, *51*(7), 972–985.
9. Coops, N. C., Achim, A., Arp, P., Bater, C. W., Caspersen, J. P., Cote, J.-F., Dech, J. P., Dick, A. R., Ewijk, K. van, Fournier, R., & others. (2021). Advances in the application of remote sensing for forest information needs in canada: Lessons learned from a national collaboration of academic, industry, and government stakeholders. *Forestry Chronicle*, *97*(2), 127–147.
10. Goodbody, T. R., White, J. C., Coops, N. C., & LeBoeuf, A. (2021). Benchmarking acquisition parameters for digital aerial photogrammetric data for forest inventory applications: Impacts of image overlap and resolution. *Remote Sensing of Environment*, *265*, 112677.
11. Czekajlo, A., Coops, N. C., & Goodbody, T. R. (2021). Untangling the effect of urban vegetation type and structure on spectrally unmixed greenness. *Remote Sensing Letters*, *12*(12), 1216–1226.
12. Achim, A., Moreau, G., Coops, N. C., Axelson, J. N., Barrette, J., Bédard, S., Byrne, K. E., Caspersen, J., Dick, A. R., D'Orangeville, L., & others. (2021). The changing culture of silviculture. *Forestry: An International Journal of Forest Research*, cpab047.
13. Toit, F. du, Coops, N. C., Tompalski, P., Goodbody, T. R., El-Kassaby, Y. A., Stoehr, M., Turner, D., & Lucieer, A. (2020). Characterizing variations in growth characteristics between douglas-fir with different genetic gain levels using airborne laser scanning. *Trees*, *34*(3), 649–664.

14. Goodbody, T. R., Tompalski, P., Coops, N. C., White, J. C., Wulder, M. A., & Sanelli, M. (2020). Uncovering spatial and ecological variability in gap size frequency distributions in the canadian boreal forest. *Scientific Reports*, *10*(1), 1–12.

15. Xu, Z., Shen, X., Cao, L., Coops, N. C., Goodbody, T. R., Zhong, T., Zhao, W., Sun, Q., Ba, S., Zhang, Z., & others. (2020). Tree species classification using UAS-based digital aerial photogrammetry point clouds and multispectral imageries in subtropical natural forests. *International Journal of Applied Earth Observation and Geoinformation*, *92*, 102173.

16. Goodbody, T. R., Tompalski, P., Coops, N. C., Hopkinson, C., Treitz, P., & Ewijk, K. van. (2020). Forest inventory and diversity attribute modelling using structural and intensity metrics from multi-spectral airborne laser scanning data. *Remote Sensing*, *12*(13), 2109.

17. Roussel, J.-R., Auty, D., Coops, N. C., Tompalski, P., Goodbody, T. R., Meador, A. S., Bourdon, J.-F., Boissieu, F. de, & Achim, A. (2020). lidR: An r package for analysis of airborne laser scanning (ALS) data. *Remote Sensing of Environment*, *251*, 112061.

18. Chadwick, A. J., Goodbody, T. R., Coops, N. C., Hervieux, A., Bater, C. W., Martens, L. A., White, B., & Röeser, D. (2020). Automatic delineation and height measurement of regenerating conifer crowns under leaf-off conditions using UAV imagery. *Remote Sensing*, *12*(24), 4104.

19. Gómez, C., Goodbody, T. R., Coops, N. C., Álvarez-Taboada, F., & Sanz-Ablanedo, E. (2020). Forest ecosystem monitoring using unmanned aerial systems. In *Unmanned aerial remote sensing* (pp. 173–196). CRC Press.

20. Goodbody, T. R., Coops, N. C., & White, J. C. (2019). Digital aerial photogrammetry for updating area-based forest inventories: A review of opportunities, challenges, and future directions. *Current Forestry Reports*, *5*(2), 55–75.

21. Goodbody, T. R. H. (2019). *Assessing the role of digital aerial photogrammetry for characterizing forest structure and enhancing forest inventories* [PhD thesis]. University of British Columbia.

22. Nuijten, R. J., Coops, N. C., Goodbody, T. R., & Pelletier, G. (2019). Examining the multi-seasonal consistency of individual tree segmentation on deciduous stands using digital aerial photogrammetry (DAP) and unmanned aerial systems (UAS). *Remote Sensing*, *11*(7), 739.

23. Coops, N. C., Goodbody, T. R., & Cao, L. (2019). *Four steps to extend drone use in research*. Nature Publishing Group.

24. Yancho, J. M. M., Coops, N. C., Tompalski, P., Goodbody, T. R., & Plowright, A. (2019). Fine-scale spatial and spectral clustering of UAV-acquired digital aerial photogrammetric (DAP) point clouds for individual tree crown detection and segmentation. *Ieee Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, *12*(10), 4131–4148.

25. Goodbody, T. R., Coops, N. C., Hermosilla, T., Tompalski, P., & Crawford, P. (2018). Assessing the status of forest regeneration using digital aerial photogrammetry and unmanned aerial systems. *International Journal of Remote Sensing*, *39*(15-16), 5246–5264.

26. Goodbody, T. R., Coops, N. C., Hermosilla, T., Tompalski, P., McCartney, G., & MacLean, D. A. (2018). Digital aerial photogrammetry for assessing cumulative spruce budworm defoliation and enhancing forest inventories at a landscape-level. *Isprs Journal of Photogrammetry and Remote Sensing*, *142*, 1–11.

27. Goodbody, T. R., Coops, N. C., Hermosilla, T., Tompalski, P., & Pelletier, G. (2018). Vegetation phenology driving error variation in digital aerial photogrammetrically derived terrain models. *Remote Sensing*, *10*(10), 1554.

28. Goodbody, T. R., Coops, N. C., Tompalski, P., Crawford, P., & Day, K. J. (2017). Updating residual stem volume estimates using ALS-and UAV-acquired stereo-photogrammetric point clouds. *International Journal of Remote Sensing*, *38*(8-10), 2938–2953.

29. Goodbody, T. R., Coops, N. C., Marshall, P. L., Tompalski, P., & Crawford, P. (2017). Unmanned aerial systems for precision forest inventory purposes: A review and case study. *The Forestry Chronicle*, *93*(1), 71–81.

Presentations

AWARE E-lecture Series *Online*

Digital Photogrammetric Applications to Enhanced Forest Inventory *October 2019*

Silvilaser — *Foz de Iguazu, Brazil*

Uncovering spatial and ecological variability in gap size frequency distributions in the Canadian boreal forest — *October 2019*

CIF-IFC Workshop — *Edmonton, AB*

Examining potential applications of UAS and digital photogrammetry for various forest management purposes — *April 2019*

FRI Forest Practitioners Conference — *Edmonton, AB*

Assessing the status of forest regeneration using digital aerial photogrammetry and unmanned aerial systems — *October 2018*

AWARE Instructional Sessions — *Kamloops, BC*

LiDAR theory, processing and implementation workshop — *February 2018*

AWARE Instructional Sessions — *Huntsville, ON*

LiDAR theory, processing and implementation workshop — *October 2017*

AWARE Instructional Sessions — *Kapuskasing, ON*

LiDAR theory, processing and implementation workshop — *October 2017*

AWARE Instructional Sessions — *Quesnel, BC*

LiDAR theory, processing and implementation workshop — *October 2017*

Silvilaser — *Blacksburg, USA*

Assessing the capacity of DAP to enhance inventory knowledge of Spruce Budworm affected forests — *November 2017*

Symposium on Systems and Analysis in Forest Resources — *Suquamish, USA*

Updating airborne laser scanning EFI metrics using UAV acquired DAP point clouds — *August 2017*

UAV and Remote Sensing Workshop — *Nanjing, China*

UAV and Digital Photogrammetry for forestry purposes — *July 2017*

Assessment of Wood Attributes for Remote Sensing AGM — *Edmunston, NB*

Assessing the capacity of DAP to enhance inventory knowledge of Spruce Budworm affected forests — *May 2017*

ForestSAT — *Santiago, Chile*

Modelling residual stand volume using unmanned aerial vehicles and digital aerial photogrammetry — *November 2016*

FP Innovations UAV Workshop — *Courtney, BC*

UAVs and the University of British Columbia — *October 2016*

Canadian Remote Sensing Symposium — *Winnepeg, MB*

Modelling residual stand volume using unmanned aerial vehicles and digital aerial photogrammetry — *June 2016*

Southern Interior Silviculture Committee — *Kamloops, BC*

DAP point clouds acquired from Unmanned Aerial Systems (UAS) for enhancing forest inventories — *February 2016*

Alex Fraser Research Forest Proof of Concept Workshop — *Williams Lake, BC*

Research in use of drones to update LiDAR forest inventories. LiDAR High Resolution Inventory for the IDF — *June 2015*