2020 Project Summaries
Boreal Ecosystem Recovery & Assessment
An NSERC Collaborative Research & Development Program

Remote Sensing Team: UAVs Provide Effective Platforms for Mapping Individual Trees

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Project Summary
Accurate land cover mapping and tree species identification was achieved using calibrated optical multispectral data from small unmanned aerial vehicles (UAVs). The best results obtained were approximately 80% accurate when compared to field survey data of several hundred individual trees. Conifers were more accurately mapped than deciduous species. Land cover mapping was >95% accurate. Near-infrared multispectral data performed significantly better than standard RGB digital camera data. Object-based image analysis with image segmentation to delineate tree crowns and machine learning on UAV imagery are important innovations in boreal forest tree species classification, land cover mapping and forest inventory.

Management Implications and Lessons Learned
Accurate and cost-effective tree species identification and land cover mapping can be achieved with UAVs equipped with calibrated multispectral sensors. The methods are relatively straightforward. The need for field surveys can therefore be reduced (not replaced). UAV technology can guide field survey efforts and provide training data for other aerial and satellite remote sensing methods.

Publication(s)
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