

Remote Sensing Team: UAV Metrics Complement Field Measurements, But Key Differences Remain

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Project Summary

Photogrammetric point clouds (PPCs) from unmanned aerial vehicles provide cost-effective, 3-D datasets that have the potential to enhance or even replace traditional vegetation measurements made in the field. We compared PPC-based structural metrics to traditional ground-based vegetation-survey metrics over a series of reclaimed petroleum wellsites and surrounding natural areas in northwestern Alberta. Our results showed good agreement between the two datasets regarding vegetation height metrics estimated at the plot level, but less agreement in vegetation cover over different height strata. This is likely due to contrasting approaches in measurement between the field and PPC. Our work demonstrates the strength of PPC datasets for reliably estimating particular attributes of vegetation structure (e.g., height), while also illustrating certain mismatches in the two approaches (e.g., vegetation cover).

Management Implications and Lessons Learned

PPC data from unmanned aerial vehicles offer a cost-effective tool for enhancing vegetation assessment and monitoring in support of land and resource management. However, it is important to note key differences between traditional field-based measurements and PPC-based approaches. We found good statistical agreement between key structural vegetation parameters, such as mean and maximum vegetation height, with PPC metrics successfully predicting most height and tree-diameter metrics using multivariate linear regression. However, PPC metrics were not as useful for estimating ground-measured vegetation cover. We believe that part of the issue lies in the mismatch between PPC- and ground-based measurement approaches, including subjective judgement on behalf of ground crews: a topic that requires more investigation.

Publication(s)

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