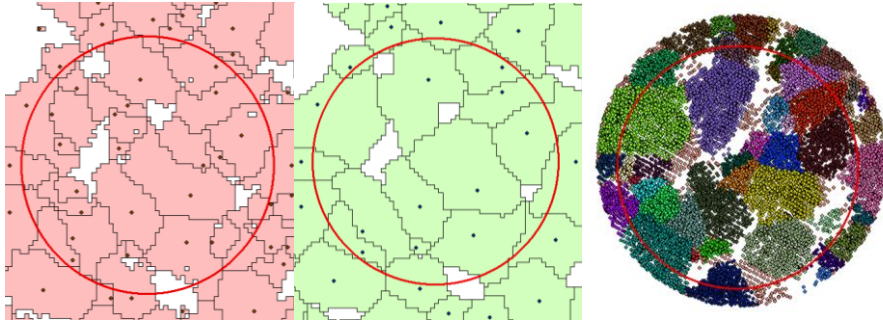


Digital-FRA



Use of digital canopy height models to improved forest resource assessments at the local and regional level

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Context — Recent developments in the field of airborne laser scanning offer new possibilities to map different forest attributes and improve forest inventory accuracy.

Objectives — In this work, two methods of LiDAR point clouds segmentation were used to obtain new variables and assess the gain in accuracy to estimate dominant height, basal area and volume, in three contrasted forest stands.

Approach — The originality of this approach is to combined segmentation methods and standards metrics based on height distribution summarized at the "plot" level. The information obtained using the segmentation variables were compared to those obtained by the "standard" method initially proposed by Næsset (1997).

Key results — The results confirm the advantage of combining the two methods.

- For basal area and volume, R^2 of 0.92 and 0.95, and mean square errors of 4.6 m²/ha (16%) and 72.4 m³/ha (17%) were obtained respectively.
- For dominant height, model error is in the range of field measurement error (estimated to be less than 1 m).

Main conclusions including key points of discussion — Segmentation allows an improvement of forest attributes estimations. The robustness of these findings remains to be evaluated on a larger number of stands and varied configurations of LiDAR acquisitions.

Future perspectives — This study opens interesting perspectives on the use of Canopy Height Models (CHM) to estimate forest attributes, including the use of CHM resulting from aerial imagery, available regularly (every 3-5 years) throughout the metropolitan territory from IGN.

Valorisation —

Publications

André, A.C., J.-P. Renaud, C. Véga, A. Munoz, J. Bock, et L. St-André. 2015. « Apport de variables issues de la segmentation d'arbres sur données LiDAR aéroportée pour l'estimation des variables dendrométriques de placettes. » *Revue Française de Photogrammétrie et de Télédétection* accepted.

André, Ana Cristina. 2014. « Apport de la segmentation à l'estimation d'attributs dendrométriques à partir de données de LiDAR aérien. » MASTER FAGE 2 AgroParisTech Nancy.

Presentations at conference

André, Ana Cristina, J.-P. Renaud, C. Véga, A. Munoz, J. Bock, et L. St-André. 2014. « Contributions of plot level Lidar tree segmentation metrics to improve forest attribute estimations. » présenté à FORESEE Workshop - Forestry applications of remote sensing technologies, INRA Champenoux, octobre 8.