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| **Maximizing Urban Tree Benefits in Christchurch through Automated Inventory Using Remote Sensing** |
| **Introduction/Aim:** Urban trees are valuable green assets, playing a vital role in improving the quality of urban environment and human well-being through the provision of ecosystem services. Given their critical contribution to human well-being, it is imperative to monitor and measure these ecosystem services. While urban forest ecosystem services cannot be directly measured on the ground, they can be effectively modelled by quantifying the structure and composition of the urban forest.Ground-based tree inventories are time-consuming, costly, and reliant on skilled labour and susceptible to human error. In this regard remote sensing offers quick, cost effective and systematic ways to measure urban forests over expansive areas. Free wall-to-wall ALS data in New Zealand can potentially be used to accurately quantify the urban forest structure. This research aims to utilize ALS data for compiling an automated urban tree inventory, which can be seamlessly integrated with ground-based models for modelling various ecosystem services.**Methods:** The proposed methodology involves employing ALS data to estimate tree structural attributes for generating a tree inventory for urban parks in Christchurch, New Zealand. For this, individual tree point-cloud segmentation is performed to derive tree height, crown width and crown base height. These ALS derived parameters further assist in predicting stem diameter and species through the use of statistical models. Ultimately, the performance of ALS derived tree metrics is evaluated against the ground measurements.**Results:** It is anticipated that using ALS data the structure of the urban forests can be accurately quantified over a large scale as opposed to limited ground-measurements.**Conclusion:** This study has the potential to optimize urban forest assessment and management in Christchurch by providing a systematic approach to generating an urban tree inventory for modelling their ecosystem services. This would enable the decision makers in making informed choices aimed at enhancing urban tree benefits, thereby promoting their equitable distribution across the city. |