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Semi-autonomous forestry assessment using small UAVs and photogrammetry.

Environmental resource monitoring and impact assessments are constrained by resource-intensive fieldwork while drone technology offers rapid, reliable, and replicable data collection and processing. This research leverages advancements in photogrammetry and market sensors and platforms. From images taken by a GoPro camera onboard a small commercial unmanned aerial vehicle (UAV) and processed by low-cost or open source software, for instance Agisoft Photoscan and Fusion, a sub-sample of national forest plots in central-southern Oregon are three-dimensionally reconstructed. Plot characteristics, such as number of trees, tree density, and height profiles, are extracted from these dense point clouds and compared to results obtained from light detection and ranging (LiDAR) flights and traditional field inventories. Preliminary work suggests UAVs will offer a complementary and supplementary tool to existing forestry monitoring and evaluation practices. This technology and work process has the potential to be customized for different contexts and applications, especially those where capacity and resources are limited. (Received February 05, 2018)