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| **The Future of High-resolution Vegetation Structure mapping for Strategic Forest Inventory Applications – on-going developments in the United States** |
| Introduction/Aim: Efforts to integrate high-resolution imagery and inventory plots aim to enhance carbon, biomass, and volume estimation at finer scales, specifically within county and national forest contexts. However, dealing with diverse data sources, including varying collection dates, specifications, sensor types, and post-processing methods, poses significant challenges for modelling and inference within a statistically designed annualized plot network.  Methods – status of current systems:  In 2024 a few systems became available to the agency. The US Forest Service in cooperation with USGS and USDA have invested in Imagery Data Manager (IDM) which was developed to process and store UAS data in a cloud environment. Also developed was the Interagency Imagery Publication Platform (IIPP) to store the National Agriculture Imagery Program (NAIP) 2D orthorectified imagery for multiple agencies in a cloud environment. The USFS funded the development of Silvimetric (Hobu, Inc.), which is an app to facilitate the storing and processing of lidar imagery in a cloud environment. The Forest Inventory and Analysis unit extracted temporally relevant lidar imagery over perturbed Nationwide Forest Inventory (NFI) plots to aid in future investigations. Core metrics were extracted. An analysis of these systems and procedures was attempted to illustrate the advantages and disadvantages in producing viable products.  Results:  A synthesis review of different systems sheds light on the advantages and disadvantages of the various platforms and evaluated against core product generation. The incorporation of a comprehensive state-wide data collect can allow for a uniform product in generating a more uniform analytical dataset.  Conclusion:  On-going investigations will lead to a better strategy to incorporate storage, processing, forest tree metrics, and NFI for nationally consistent, localized coverage. |