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| **National mapping of forest biodiversity indicators based on NFI and lidar data** |
| Forests with high biodiversity value, such as primary and old-growth forests, play a vital role in carbon storage for climate mitigation and in providing suitable habitats for numerous endangered species. Consequently, various strategies and regulations under the EU Green Deal are aimed to map and strictly protect the remaining primary and old-growth forests. At present, national forest resource maps are operationally produced by integrating the National Forest Inventory (NFI) with national airborne lidar data on a large spatial scale. This approach provides spatially continuous maps of forest attributes, such as biomass and volume. However, these maps often limited in quantifying ecologically meaningful indicators related to primary or old-growth forests. In this study, we analyzed to what extent the NFI field measurements together with national airborne lidar and other data products, can be utilized to map forest age and structural complexity. We developed linear mixed effect and random forest models to predict forest age for different site indices, as well as single and multilayered forests across all forested areas in Norway, covering an area of 122,000 km². Our findings indicate that various ecological indicators can be predicted with overall accuracies ranging from fair (51%) to good (74%). Overall, the results demonstrate the potential of combining NFI and national lidar datasets to develop further ecologically relevant indicators for consistent biodiversity monitoring. |