

Understanding central European forest practitioners' requirements for remote sensing-based information products: A questionnaire survey

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Show abstract

Despite decades of development, the adoption of remote sensing-based information products in the forestry sector remains limited in central and southern Europe. This may partly be due to a mismatch between the developed remote sensing products and the needs of potential users. In this study, we present the results of a survey conducted with 355 forest practitioners from eight central and southern European countries. The survey aimed to identify practitioners' technical requirements for four types of remote sensing-based information products: tree species, canopy height, wood volume/biomass, and forest disturbances. Respondents were asked about their preferences regarding thematic and spatial detail, the maximum acceptable error, and the temporal frequency of the information layers and for the main application fields of the information layers. The study also examined whether demographic variables of the participants including education, age, and professional background influenced these requirements. Preferences for spatial and thematic detail were found to be relatively diverse, whereas more consistent patterns emerged regarding error tolerances and temporal frequency demands. For example, the maximal acceptable error for detailed tree species maps was fluctuating between 5 and 15%, the maximal error of canopy height maps deemed acceptable by interviewees was between 1 and 3 m and the maximal acceptable error for biomass maps was between 5 and 20%. When comparing the demands of the practitioners with the current state-of-the-art in remote sensing, our results suggest that for some products, such as canopy height maps, existing remote sensing technologies and workflows can meet all practitioner demands. However, focusing on other information products, this is only partly the case: In our view, remotely sensed information on forest disturbances partially meets practitioner needs, while products related to tree species and wood volume/biomass currently fall short in terms of thematic detail and accuracy required by practitioners in central and southern Europe. The application fields for the information layers included well-expected tasks but the participants also named some quite unexpected "out-of-the-box" ideas of how to make use of remote sensing based information layers. These have so far been mostly ignored by the remote sensing community. With respect to the demographic groups, we found no statistically significant differences. While our results suggest that further technical innovation is still needed with respect to some information products to match the demands of the practitioners, it may also be questioned whether the demands are fully realistic. For example, it is well known that many traditional information products on which current forestry practices base on, do not reach the accuracy demanded by the practitioners. So, providing information products that are better than what practitioners are used to work with at the moment, may still create added value, even if the defined accuracy requirements are not matched. Our study contributes to our understanding of the alignment and misalignment between the technical requirements of forest practitioners and the capabilities of remote sensing-based information products.