

Abstract template for the conference “A century of national forest inventories – informing past, present and future decisions”

Dear author. This is a two-page template that in the first page will ask for information on presenter name, topic, and preferred presentation form.

On page two, you are asked to fill in your abstract in the format and font size indicated. Please remember to include authors affiliation information in the footer section of page two. The length of the abstract may not be more than one page including references.

Abstract title:		Harmonisation of stem volume estimates in European NFIs
Take-home message:		<i>The volume predictions of sample trees lack comparability among NFIs. Country-specific harmonisation functions were implemented by 21 European NFIs. Comparable growing stock volume figures were produced for the first time on a large-scale and indicate the relevance of harmonisation for international forest statistics.</i>
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General topic, see website: <small>(please double click on the check box and activate the relevant one)</small>	<input type="checkbox"/>	Improving future NFIs by learning from the past
	<input checked="" type="checkbox"/>	NFIs today and in the future
	<input type="checkbox"/>	Cutting edge and futuristic inventory techniques and technologies
Preferred presentation form:	<input checked="" type="checkbox"/>	Oral presentation
	<input type="checkbox"/>	Poster
<p><i>Abstracts will be reviewed by members of our scientific committee and you will be given information on decisions in due time after the submission deadline has passed.</i></p>		

Harmonisation of stem volume estimates in European NFIs

Thomas Gschwantner et al. (contributors from 21 NFIs)

Introduction: NFIs have different histories and were established by taking into account the forest conditions and information needs in the countries (Tomppo et al. 2010). Consequently, information about forest resources usually lacks comparability across country borders. Differences in the tree volume predictions of volume models regarding included tree parts and different dbh-thresholds ranging from 0 to 12 cm cause discrepancies in NFI volume estimates like growing stock, increment and harvest. For improving the information of European forest resources, harmonisation measures were implemented by 21 NFIs to obtain consistent stem volumes as calculation input to growing stock estimation.

Materials and methods: The harmonisation method established for European NFIs relies on common reference definitions and bridging functions as basic components (Tomppo and Schadauer 2012, McRoberts et al. 2010, Vidal et al. 2008). While reference definitions define the target object of interest (e.g. stem volume, growing stock) for the purpose of harmonisation, bridging functions convert estimates based on country-level definitions into estimates in accordance with the common reference definitions. For harmonising the stem volume estimates in European NFIs, reference definitions were specified to include five alternative combinations of the tree parts stump, bole, stem top and branches of trees above the dbh-threshold of 0 cm. Country-specific bridging functions were developed and implemented by the NFIs in their program codes which process the data stored in the NFI data bases. Un-harmonised and harmonised volumes of individual sample trees were predicted, and up-scaled to obtain growing stocks according to the country-level definitions, and the five reference definitions. Comparisons were made to quantify the impact of deviations between stem volume definitions on the growing stock estimates.

Results: The harmonisation of stem volume estimates revealed considerable discrepancies between country-level and harmonised growing stocks. The differences are in the range of about -10 % to +30 % compared to the reference definition which includes the stem volume above stump. The percentages of merchantable stem volume are between 87 % and 96 % for the 21 NFIs. The non-merchantable stem parts consist of stumps and stem tops of which stumps accounted for 2% to 7% and stem tops for 1% to 9% of the stem volume. Large branches have a diameter of 7 cm or more and contribute between 3% and 21% of the merchantable broadleaved growing stock. The trees below the dbh-threshold represent up to 6% of stem volume.

Conclusion: Comparable stem volume estimates were produced for the first time on a large-scale for 21 European NFIs. The magnitude of the observed differences between un-harmonised and harmonised growing stock estimates underline the relevance of harmonisation for comparable NFI reporting in international statistics and processes. Harmonised stem volume estimates are also important when used as input for scenario modelling at European level.

References:

McRoberts et al., 2010. In Tomppo et al. (eds), Springer, 33–43

Tomppo et al. (eds) National Forest Inventories – Pathways for Common Reporting, Springer

Tomppo and Schadauer, 2012, For Sci 58, 191–200

Vidal et al. 2008, Silva Fenn 42, 247 – 266