

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:		A century of National Forest Inventory in Norway
Take-home message:		The field work for the first Norwegian National Forest Inventory (NFI) begun in 1919 due to the fear of an over-exploitation of forest resources. Today, the NFI is a monitoring program providing information on state and change of ecosystem services in forests and the landscape.
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General topic, see website: <small>(please double click on the check box and activate the relevant one)</small>	<input checked="" type="checkbox"/>	Improving future NFIs by learning from the past
	<input 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
<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>		

A century of National Forest Inventory in Norway

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Background: In the beginning of the 20th century, forestry was one of the most important sectors in Norway. The prevailing management regime was high grading, where single trees were allowed to be harvested as soon as their dbh reached a certain threshold. An agitated discussion about the likely decline of forest resources due to over-exploitation were ongoing. In order to base the discussion on facts rather than anticipations, the young state of Norway implemented measures to carry out *Landsskogtakseringen* – the Norwegian National Forest Inventory (NFI) with the aim to close the information gap regarding increment, timber volume stock, and the production capabilities of the landscape.

Historical development: The field work of the 1st NFI started in Østfold county in August 1919 after two years of preparation and already in 1920, the results were published (*Landsskogtakseringen* 1920). Based on experiences from the municipality Åmot in 1907 and Värmland county (Sweden) in 1911, the design of a strip sampling was chosen and uncertainties were estimated utilizing difference estimators. Trees were calipered and species recorded 5 m left and right of a center-line that was oriented perpendicular to the main valleys (E-W), with a distance of 4 km between lines. Site quality was recorded in 5 categories. The proportions of the land cover categories forest, mire, cropland, grassland, and impediment were recorded for each line. The field team consisted at least of a team leader, a navigator, and on each side a field assistant and a caliper operator. Additional staff transported tents and supplies. By 1930, most forests below the alpine tree line in all except the two northernmost counties were inventoried with distances between belts varying from 1-5 km. The 2nd to 5th inventories in the years 1937-1956, 1957-1964, 1964-1976 and 1980-1986, respectively, were based on temporary sample plots from 1954 and clusters on a 3x3 km grid from 1956.

Development in the recent decades: The current NFI grid was used in the 6th NFI from 1986 to 1993, where permanent plots on a 3x3 km grid were established below the alpine forest border. As of the 7th inventory from 1994 onwards, the NFI is continuous, and 1/5th of the plots are measured annually. All trees with a diameter ≥ 5 cm are measured on circular, 250 m² plots. Since 1994, each field “crew” consists of only one person. All plots that may contain trees are visited; plots not visited in the field are interpreted on aerial images. All plot center coordinates are recorded with GPS receivers. County inventories with additional temporary sample plots clustered with the permanent plot are carried out every 15 years. With the increasing importance of climate reporting, the NFI grid was expanded in 2005 to cover the mountain forest on a 3x9 km grid in all counties south of Finnmark, and in 2007 a 9x9 km grid was established in Finnmark. Since 2012, the NFI grid within protected forest is doubled along the E-W and N-S directions.

Current development: Since 2009, considerable research efforts went into the integration of remote sensing technologies which resulted in the gradual publication of the Norwegian Forest Resource Map since 2015 (Astrup et al. 2019), which is also used for small area estimation on the municipality level (Breidenbach 2016). As of today, more than 120 variables are recorded in the NFI and include variables such as bilberry cover, drainage status, deadwood, and forest health. For the future, we see the inclusion of further variables for monitoring ecosystem services, and an increasing demand for maps.

References:

- Landsskogtakseringen 1921: Taksering av Norges skoger. I. Østfold fylke. Norsk Skoletidendes Boktrykkeri.
Astrup et al. 2019: SJFoRes, <https://doi.org/10.1080/02827581.2019.1588989>.
Breidenbach 2016: <https://landsskog.nibio.no/>. Make your own NFI estimates. Web application.