

# The Portuguese National Forest Inventory

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**Introduction:** The National Forest Inventory department was established in 1963 within the Portuguese Forest Service. The first Portuguese NFI took place during the years 1965-1966 and that was the first national forest evaluation process to include a biometric characterisation of forest stands based on the measurement of a sample of field plots. Since then, five more NFIs took place, with an approximately 10 year periodicity. Over the years, NFI results have become a cornerstone for forest policy and methods have evolved to allow the monitoring of forest transformation over time. Besides that, the latest NFI includes the evaluation of new forest features, namely habitats identification, soil parameters characterisation by lab analysis, or fuel model assessment, to support new reporting requirement. In this poster are presented an overview of the Portuguese NFI track record, the NFI methodology, main results and intended future directions.

**Materials and methods:** The latest NFI, the NFI6, is being developed based on a three phase approach. In the first phase, it is evaluates the area of the different land use / land cover classes by aerial imagery visual classification. In the second phase, ground vegetation, mainly forests and shrublands, are characterised by measurements and observations taken in different sampling devices on the field (circular plots, linear transects, and patches). And in the third phase, a subsample of field visited plots are soil sampled. All three phases are based on sampling methods, established on a common sampling grid. This grid system consists of a 500 m x 500 m grid (ca. 360 thousand points – called photo-points), that is used for phase 1, and it includes a sub-grid of 2 km x 2 km that is the basis for field work, and another sub-grid of 900 points for soil sampling. Standing volume estimation was the main objective of the first NFIs, but nowadays, biomass and carbon stock estimations, as well as the production of non-wood goods such as cork, resin and acorn are equally relevant. This estimations are done based on allometric models, most of them developed in Portugal for the main tree species present. Many other indicators are calculated based on NFI original data using statistical methods. An entirely new information system was developed for the NFI, and it supports the data gathering process verification and validation, the whole data processing procedure, and the dissemination of results. The system is being developed in SQL server and communicates with GIS systems and webpages.

**Results:** The Portuguese NFI provides official estimates at different scales, ranging from national level, down to NUTS level IV, although with different precision and detail levels imposed by sampling constraints. An historical database of the Portuguese forest evolution has been developed and it clearly presents the trends in forest area and biomass. For supporting the development of a consistent monitoring system, the sampling grid was applied to four different airborne aerial imagery national coverages obtained in 1995, 2005, 2010 and 2015. Based on this data, it was possible, and for the first time, to compute land use/cover transition matrices, which provided a relevant insight into Portugal land use/cover dynamics.

**Conclusion:** The Portuguese NFI has a track record of 56 years of consistent and reliable forest data production. The results of the Portuguese NFI, and its historical database, are used as basis for many decision-making processes in forest and environment policy, forest management, forest products industries, and for evaluating the outcomes of the implemented plans and decisions. The permanent update of methods and technological solutions is of the utmost importance to guarantee that this fundamental, and intergenerational, process remains relevant for many years to come.