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Regulatory and information support for evaluation of biological productivity of Ukrainian forests and climate change

Petro Lakyda, Roman Vasylyshyn, and Ivan Lakyda
Department of Forest Management of ERI FLPM of NUBiP of Ukraine, Kiev, Ukraine (lakyda@nauu.kiev.ua)

Stabilization and preservation of the planet's climate system today is regarded as one of the most important global political-economic, environmental and social problems of mankind. Rising concentration of carbon dioxide in the planet's atmosphere due to anthropogenic impact is the main reason leading to global climate change. Due to the above mentioned, social demands on forests are changing their biosphere role and function of natural sink of greenhouse gases becomes top priority.

It is known that one of the most essential components of biological productivity of forests is their live biomass. Absorption, long-term sequestration of carbon and generation of oxygen are secured by its components. System research of its parametric structure and development of regulatory and reference information for assessment of aboveground live biomass components of trees and stands of the main forest-forming tree species in Ukraine began over twenty-five years ago at the department of forest mensuration and forest inventory of National University of Life and Environmental Sciences of Ukraine, involving staff from other research institutions.

Today, regulatory and reference materials for evaluation of parametric structure of live biomass are developed for trees of the following major forest-forming tree species of Ukraine: Scots pine of natural and artificial origin, Crimean pine, Norway spruce, silver fir, pedunculate oak, European beech, hornbeam, ash, common birch, aspen and black alder (P.I. Lakyda et al., 2011). An ongoing process on development of similar regulatory and reference materials for forest stands of the abovementioned forest-forming tree species of Ukraine is secured by scientists of departments of forest management, and forest mensuration and forest inventory.

The total experimental research base is 609 temporary sample plots, where 4880 model trees were processed, including 3195 model trees with estimates of live biomass components. Laboratory studies conducted on 1743 research sections of tree stems, 809 samples of crown branches, 2560 model tree greenery branches, 346 batches of needles and 534 batches of leaves. These materials have high scientific and practical value, forming a basis for quantitative evaluation of biological productivity of forests in Ukraine, which are of great importance for mitigation of climate change. They also can be used as a data source for development of systems of models of various purposes, which find their application in Ukrainian and world forest science and practice.