Abstract:

Site productivity can be defined as the site capability to produce biomass. In forestry this definition is often narrowed to the stand production. Knowledge about forest sites productivity is the base for formulating goals and strategic decisions in forest management.

The aim of this thesis was to determine relations between both potential (described by site index) and current (described by stand increment) productivity and :

1) site characteristics – geological substratum, soil, topography
2) stand characteristics – height, age, diameter at breast height, density, species composition

Spatial diversity of site productivity was analysed. The research was conducted in mixed, uneven-aged stands at Suchedniów Forest District.

Generalized additive models (GAM) were used in analysis of the influence of soil properties on site index. Significant parameters are: share of sand and loam fractions, carbon stock, thickness of organic level and it's pH, non-crystalline iron compounds and C/N indicator. In addition stand age and species composition were used.

A number of GAM models of: basal area increment, volume increment and biomass increment were developed for five- and ten years period.

Variants of models differed by types of variables. In part of models only dendrometric characteristics were used and in the rest both stand and soil properties, for which the greatest share of explained variance was evaluated – from 77% to 88%.

Significant stand characteristics, influencing increment were: stand breadth, height, volume per hectare, density, total aboveground biomass and age. Significant soil properties were: soil grading an carbon stock.

With kriging method spatial diversity of site index and stand increment were analysed. Spatial autocorrelation for rests of models using only dendrometric variables and lack of that correlation for rests of models using both stand and soil properties was determined. This shows the significance of site in forming relations between stand properties and increment.