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First author: Pretzsch, H.

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Abstract

Models for Forest Ecosystem Management: A European Perspective

H. Pretzsch, R. Grote, B. Reineking, Th. Rötzer and St. Seifert

Background: Forest management in Europe is committed to sustainability. In the face of climate change and accompanying risks, however, planning in order to achieve this aim becomes increasingly challenging, underlining the need for new and innovative methods. Models potentially integrate a wide range of system knowledge and present scenarios of variables important for any management decision. In the past, however, model development has mainly focused on specific purposes whereas today we are increasingly aware of the need for the whole range of information that can be provided by models. It is therefore assumed helpful to review the various approaches that are available for specific tasks and to discuss how they can be used for future management strategies.

Scope: Here we develop a concept for the role of models in forest ecosystem management based on historical analyses. Five paradigms of forest management are identified: (1) multiple uses, (2) dominant use, (3) environmentally sensitive multiple uses, (4) full ecosystem approach and (5) eco-regional perspective. An overview of model approaches is given that is dedicated to this purpose and to developments of different kinds of approaches. It is discussed how these models can contribute to goal setting, decision support and development of guidelines for forestry operations. Furthermore, it is shown how scenario analysis, including stand and landscape visualization, can be used to depict alternatives, make long-term consequences of different options transparent, and ease participation of different stakeholder groups and education.

Conclusions: In our opinion, the current challenge of forest ecosystem management in Europe is to integrate system knowledge from different temporal and spatial scales and from various disciplines. For this purpose, using a set of models with different focus that can be selected from a kind of toolbox according to particular needs is more promising than developing one overarching model, covering ecological, production and landscape issues equally well.

[forest management](#)

[sustainability](#)

[methodology: modelling](#)

Notes

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Tartalom:

Introduction

Overview of model approaches

Maps and yield tables

Growth- and yield simulators

Matter-balance models

Landscape models

Visualization models

Examples of models for different applications

SILVA, a forest growth simulator

BALANCE, a matter-balance model

LandClim, a landscape model

TREEVIEW and L-VIS, visualization tools

Discussion

Link between 'mechanistic' models and inventory measurements

Future model development

Tailoring models for users

Conclusions and prospects

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Literature cited

Ecosystem management, management paradigms, decision support in Europe, sustainability, models, spatial and temporal scales, scaling, scenario generation, visualization

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