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Slovak Forestry Needs Evaluation and Situation in DSS Implementation

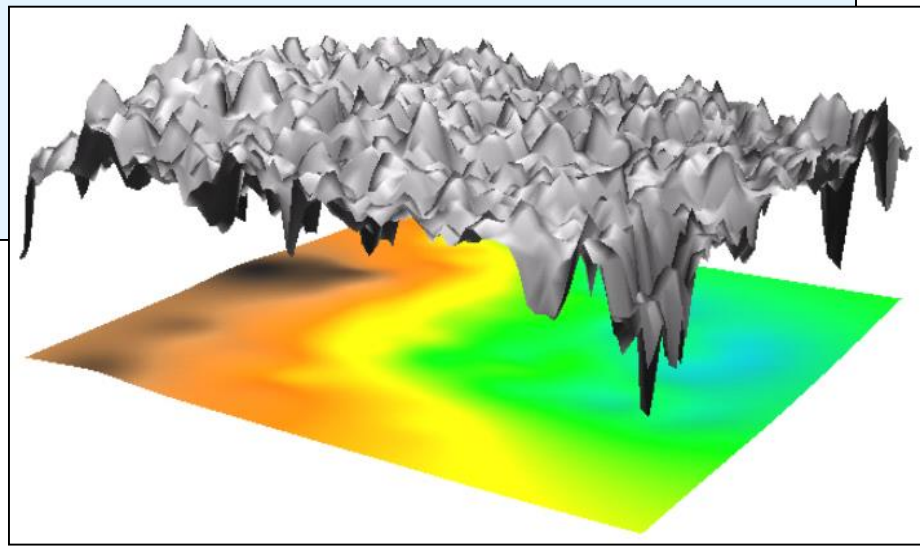
Jan Tucek
Technical university in Zvolen, Faculty of Forestry

Seminar on DSS Tools Implementation into Forest Management Practice, Zvolen, 2. 12. 2014.

Introductory remarks

Slovak forestry needs and situation in DSS implementation

TUZVO activities



Adaptive Forest Management – Decisive foundations

(by Hainimann, 2010)

1. Dynamic ecosystems behavior,

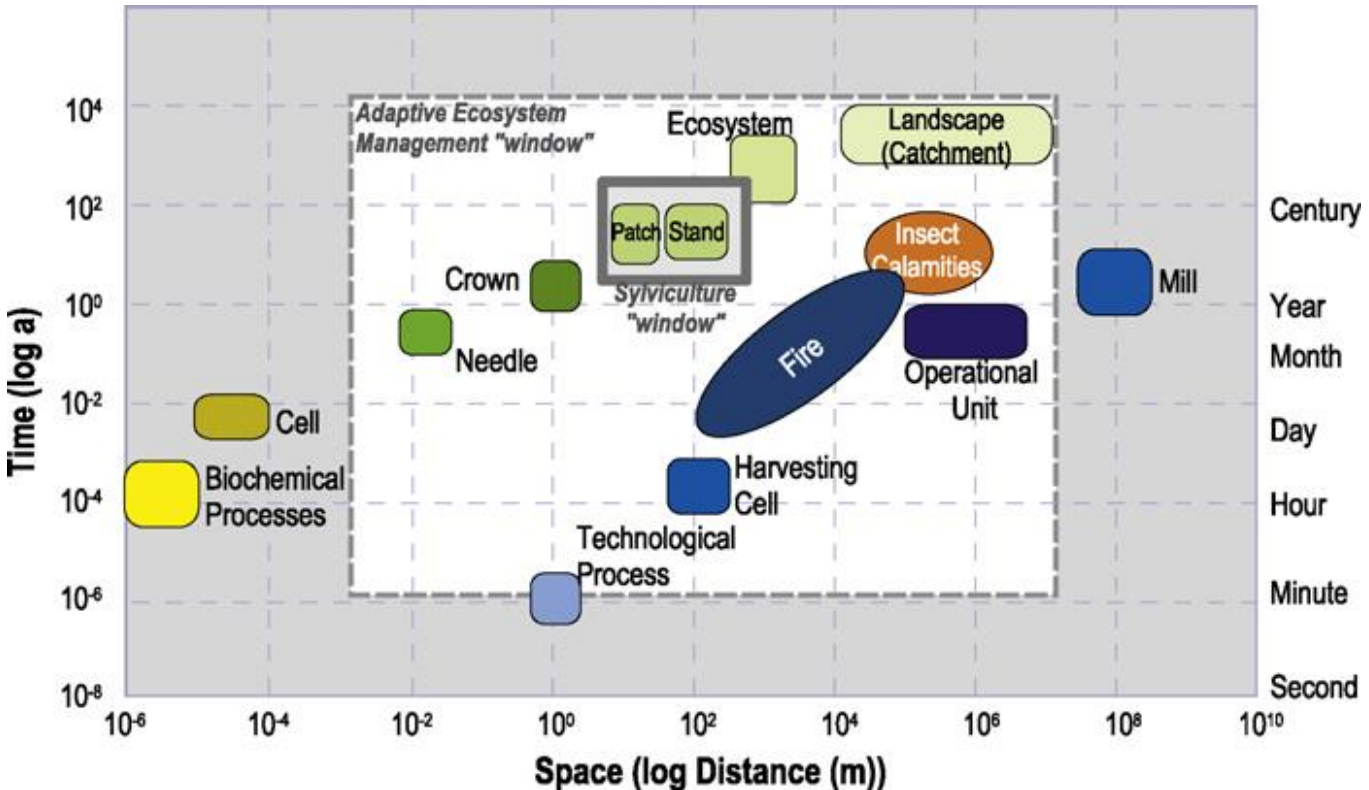
Emergence, Adaptation, Resilience: „purposeuseful change“.

2. Space – scale matters,

Patch/Stand as a space – time window for traditional silviculture-based forestry.

3. Risk informed management,

Critical effect, dose-response relationships.



Melding the Minds of the "-ists" and "-ologists"

BEYOND MAPPING

The ***"-ists"*** — and — The ***"-ologists"***

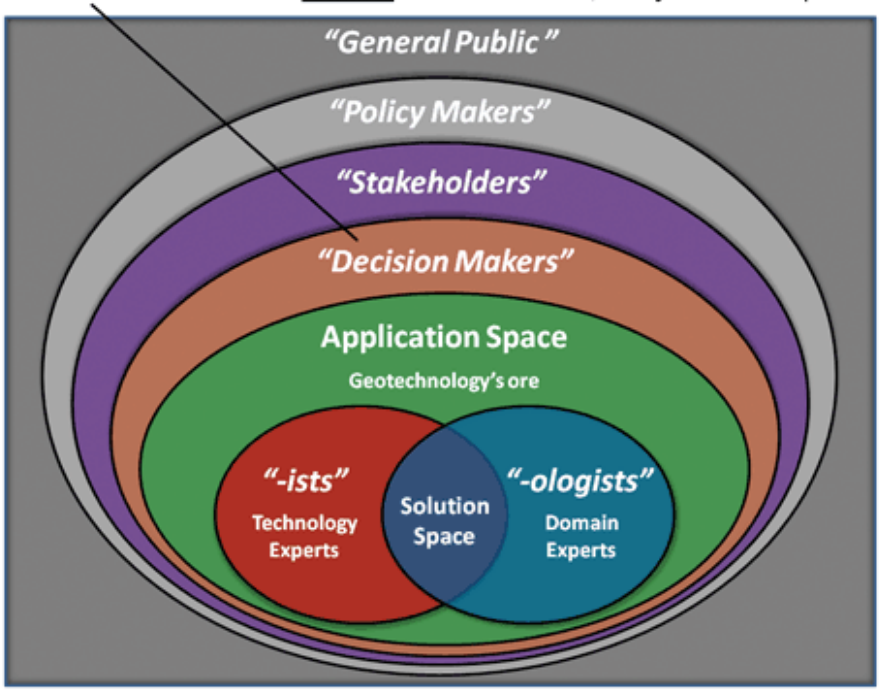
...understand the "tools" that can be used to display, query and analyze spatial data

...understand the "science" behind spatial relationships that can be used for decision-making

Data and Information focus *Knowledge and Wisdom focus*

Together the ***"-ists"*** and the ***"-ologists"*** frame and develop the **Solution** for an application.

Decision Makers utilize the **Solution** under ***Stakeholder***, ***Policy*** & ***Public*** auspices.



THE ESSENTIAL VOICE OF THE INDUSTRY
GeoWORLD
JULY 2009

Precision Land Use Management

Coordinates and controls biophysical, technical and administrative processes of primary production by semi-automatic or automatic control systems in order to balance the spatio-temporal variability

of (1) products and services (output),
of (2) management practices (imput),
and of (3) site and disturbance factors (exogene variabels)

in a way that maximizes biological and technical efectivity of the system while minimizing adverse effects on the environment.

4 key issues related to system control:

The goal (What
The purpose (What For)
The strategy (How)
The implementation (With What Type of Means).

The implementation requires sensors, technology, systems.

Heinimann, 2007, 2010

Annals of Forest Science (2012) 69:1–15
DOI 10.1007/s13595-011-0153-4

REVIEW PAPER

A review of decision-making approaches to handle uncertainty and risk in adaptive forest management under climate change

Rasoul Yousefpour · Jette Bredahl Jacobsen · Bo Jellesmark Thorsen · Henrik Meilby · Marc Hanewinkel · Karoline Oehler

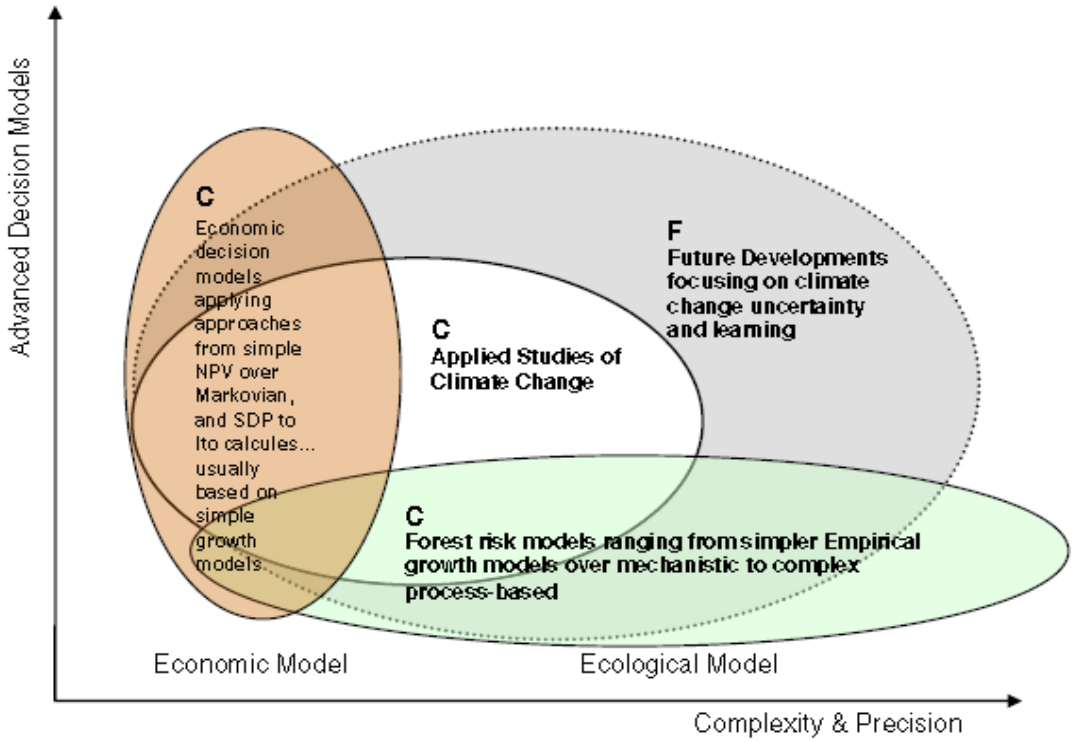
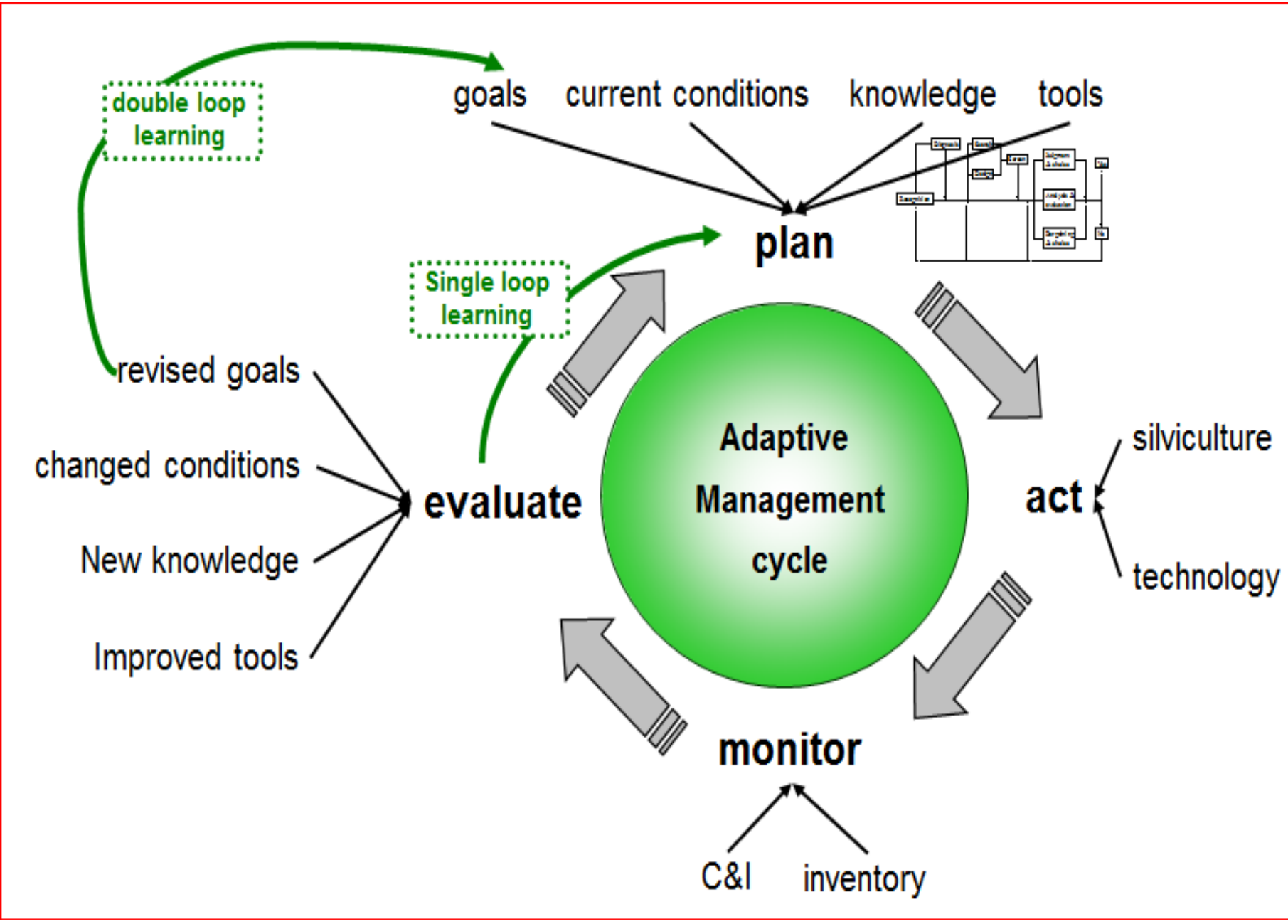


Fig. 7 Chart illustrating current (C) and future (F) situations in research emphasising adaptive forest management modelling

Developing operational growth models that include causal components facilitating development of adaptive management schemes.

Bridging the gap between comprehensive ecological models and economic models to assist forest decision makers with appropriate and complete modelling tools.


double loop learning
goals
current conditions
knowledge
tools
plan
Single loop learning
revised goals
changed conditions
New knowledge
Improved tools
evaluate
Adaptive Management cycle
act
silviculture
technology
monitor
C&I
inventory

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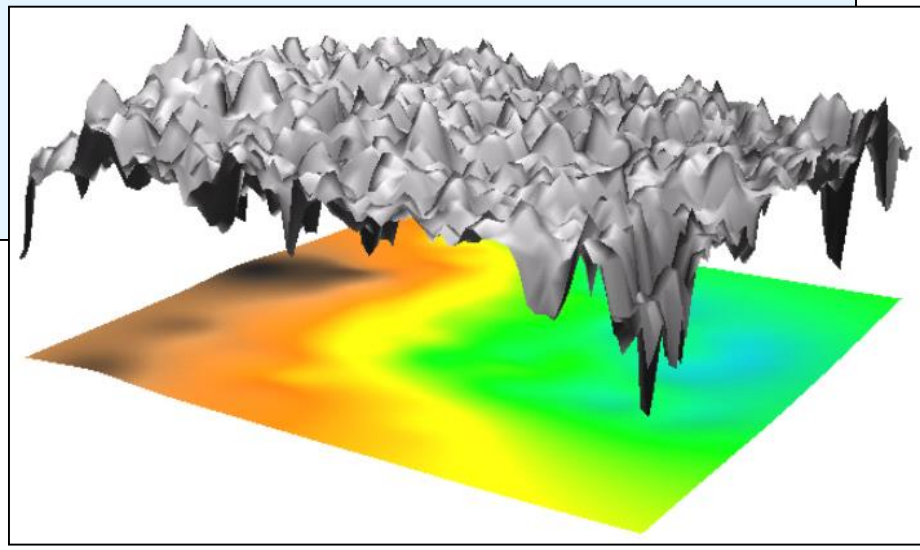

POTREBA A MOŽNOSTI INOVÁCIE RÁMCOVÉHO PLÁNOVANIA HÚL NA SLOVENSKU

Ladislav Kulla, Michal Bošeľa, Karol Burgan
NLC-LVÚ Zvolen, T.G. Masaryka 22, 960 92 Zvolen

Abstrakt:
Príspevok sa zaoberá možnosťami inovácie rámcového plánovania na Slovensku. Konštatujú sa silné a slabé stránky súčasného systému s ohľadom na trendy vývoja v zahraničí. Prezentované sú výsledky výskumu priestorovej variability prirodzenosti a produkcie hlavných drevín na Slovensku, ktoré sa využili ako podklad pre návrh zjednodušenia priestorovej a stanovištnej rajonizácie Slovenska pre potreby rámcového plánovania. Navrhnuté sú možnosti ďalšieho smerovania rámcového plánovania na Slovensku.
Kľúčové slová: rámcové plánovanie, prirodzenosť drevín, produkcia drevín, lesné oblasti, stanovištné jednotky, hospodárska úprava lesov

Abstract:
Paper deals with possibilities of innovation of framework planning in Slovakia. Strengths and weaknesses of current system are stated, with regard to trends of forest planning development abroad. Research results are presented on spatial variability of naturalness and production of main tree species in Slovakia, which were used as a basis for proposal of simplification of spatial and site regionalization of Slovakia for purposes of framework planning. The opportunities of next development of framework planning in Slovakia are proposed.
Key words: framework planning, tree species naturalness, tree species production, forest regions, site units, forest management

Forest management planning

Slovakia

Only one proposal of forest management plan (FMP) is elaborated.

Basic tool of the planning process - classical growth and yield tables.

Forest owners (stakeholders) participate in their own planning process only marginally.

Complex DSS absent

World

Many alternative FMPs are proposed.

Basic tool of the planning process –

a new generation of growth simulators.

Multicriterial optimization with regard to apriori known owner's goals and preferences.

Many DSSs exist

Why is only one alternative of FMP is elaborated ?

Management actions for each stand are prescribed on the base of:

Detailed survey of ecological and management conditions – soil, climate, forest type, forest-management groups of types etc.

Precise inventarization of current stand state – species composition, density, stand volume and quality, health status etc.

Complex evaluation of stand ecological stability – mechanical stability, naturalness of species composition, health status and so on.

Complex evaluation of fulfilling forest function – identification, quantification and integration of present forest functions and setting of main management goals (forest categorization).

Management actions are selections from predefined optimal forest management model

Forest management model – set of optimal basic forest management decisions, stand production targets and rules related to restoration, tending, harvesting, regeneration and protection valid for so called operational set.

Operational set – subset of forest stands with the same category(production, protection or social forests), stand origin (seed, coppice), degree of ecological stability and current species composition growing on the same site type.

We mean/stated/believe that proposed FMP is optimal !

What guaranties the optimality of the management actions given by forest management model ?

Reasons

250 year-long history of forest management, silviculture and protection in Slovakia.

Unique phytocenological classification according to Zlatnik (1957).

High-quality growth and yield tables with known precision.

Clear methodology of identification, quantification and integration of forest functions on certain area.

Beliefs

Belief that correct approaches of tending, harvest, restoration/regeneration, protection actions etc. are used.

Belief that we exactly know of target stand state corresponding to certain natural conditions.

Belief in correct determination of current stand state and its future development.

Belief in correct setting of management goals and preferences (especially strategic).

Forest Management Problems in Slovakia (one of possible aproximation)

High diversity of natural and management conditions in Slovakia. Problem to apply rather general recommendations and rules from operational sets to particular stand.

Most of actions and rules are defined only qualitatively. Too much space for a subjective decision making is allowed.

Absent of feedback among prescribed actions and their consequences. Actions are planned without risk assessment.

Low adaptability of the prescribed schematic approaches. Problem of implementing the new knowledge, absent of actions against climate change impacts etc.

Only limited (and mostly formal) participation of the forest owner and other stakeholder group in the process of FMP elaboration.

Tuček, J. (2013): The place of geographic information and geoinformation technology in precision forestry and its complementary relation to adaptive forest management. In Implementation of DSS tools into the forestry practice : reviewed conference proceedings, ISBN 978-80-228-2510-8. pp. 19-34.

Sedmák, R., Fabrika, M., Bahýľ, J., Pôbiš, I., Tuček, J. (2013): Application of simulation and optimization tools for developing forest management plans in the Slovak natural and management conditions, In Implementation of DSS tools into the forestry practice : reviewed conference proceedings / eds. Ján Tuček ... [et al.], Zvolen : Technical University in Zvolen, 2013. - ISBN 978-80-228-2510-8. pp. 139-152.

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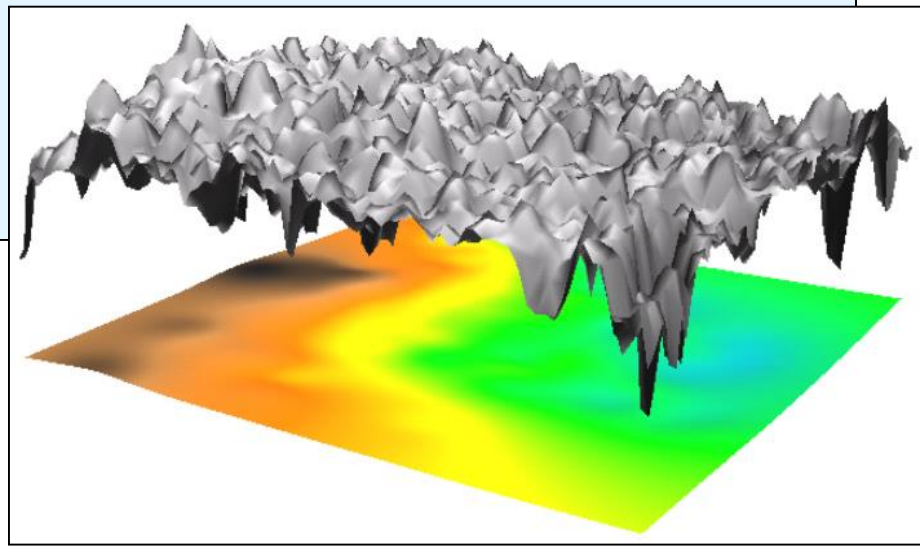


Precise Forestry Priciples and Methodes Research VEGA 1/0764/10, 2010 - 2011

Precise Forestry principles adaptation for Slovak conditions,

Progressive Remote Sensing data application,

Mobile devices utilization,

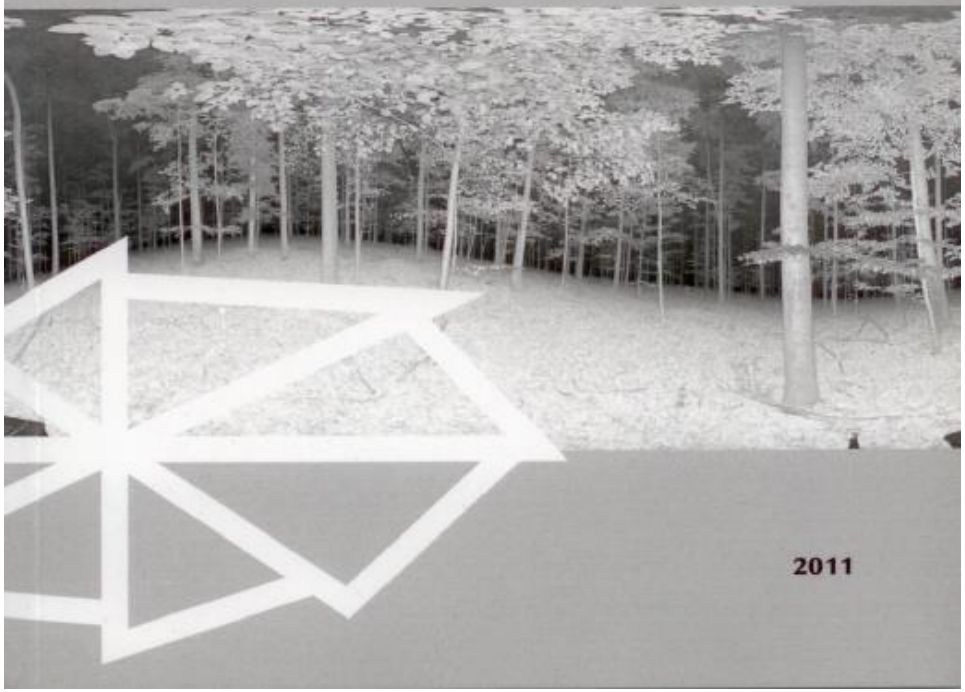
Geographical databases structure and content,

Precision Forestry applications – Openning-up, Logging technologies planning and optimalisation, Forest Fire protection and precaution.

TECHNICKÁ UNIVERZITA VO ZVOLENE
LESNÍCKA FAKULTA

Ján Tuček, Milan Koreň, Andrea Majlingová
Róbert Smreček, Jozef Suchomel

GEOINFORMATIKA A GEOINFORMAČNÉ TECHNOLÓGIE V PRECÍZNOM LESNÍCTVE



2011

Centre of excellence:
Decision making support in forest and landscape

OP Research and development, Priority ax 2., Action 2.1.:
Support of networks of excellent research and development centers as pillars of regional development and interregional cooperation.

Applicant:	**Technical University in Zvolen**
Partners:	**National Forest Center Zvolen**
Period of solution:	**2011 - 2014**

Strategic aim of the project:

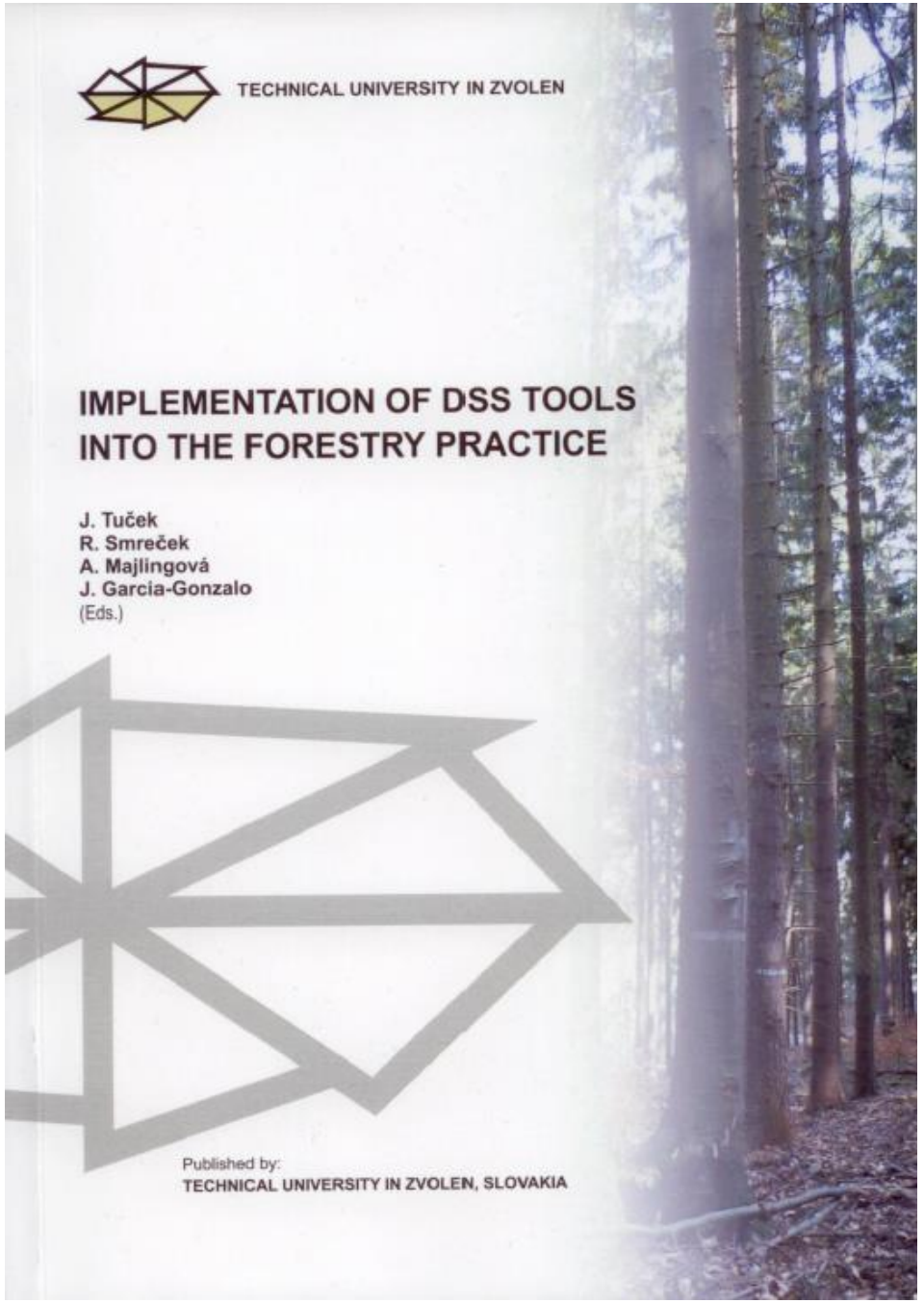
To support the research for quality improving of decision making in forest and landcape management on the base of geoinformatics.

AGENTÚRA
NA PODPORU
VÝSKUMU A VÝVOJA

Development of modules and interfaces for forestry decision support systems
APVT bilateral project PT/SK 2010 – 2012, 2013 - 2014

Project goals:

Evaluation of the decision support tools used in forest management in Portugal and Slovakia,
Interfacing of the Sibyla tree simulator (SK) with decision support tools SADfLOR and IDM (PT),
Aplication of the integrated tools in case study data elaboration,
Exchange visits of solution team members in PT and SK,
Common projects, events and publications preparing.


TECHNICAL UNIVERSITY IN ZVOLEN
IMPLEMENTATION OF DSS TOOLS
INTO THE FORESTRY PRACTICE
J. Tuček
R. Smreček
A. Majlingová
J. Garcia-Gonzalo
(Eds.)
Published by:
TECHNICAL UNIVERSITY IN ZVOLEN, SLOVAKIA

www.forestdss.org

forestDSS

Community of Practice
Forest Management Decision Support Systems

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ForestDSS Wiki

The Wiki provides a repository of DSS descriptions, country reports, case studies and lessons learned:

- List of Forest Decision Support Systems
- List of Case Studies
- List of Lessons Learned
- Exploring the WIKI content by queries

Go to Wiki

Latest Community Articles

IFORS 2014: Presentations from forestry sessions #1 — 0

05.09.2014 | Ola Eriksson

A lot of interesting presentations were found at the IFORS 2014 conference in Barcelona 13-18 July this year. Some of them have been made available to the CoP from the authors. The

News

CoP meets at IUFRO Congress — 08 Aug

At the 24th IUFRO World Congress in Salt Lake City, Utah, USA from October 5-11, 2014 the CoP will organize the session "Providing Ecosystem...

CoP Side event at IFORS conference — 10 Jul

Members of the Working Committee of the Community of Practice will gather during a side event of the 20th Conference of the International...

DSS 2.0 – Supporting Decision Making With New Technologies — 11 Jun

The new book DSS 2.0 – Supporting Decision Making With New Technologies presents the proceedings of the IFIP TC8/Working Group 8.3 conference held

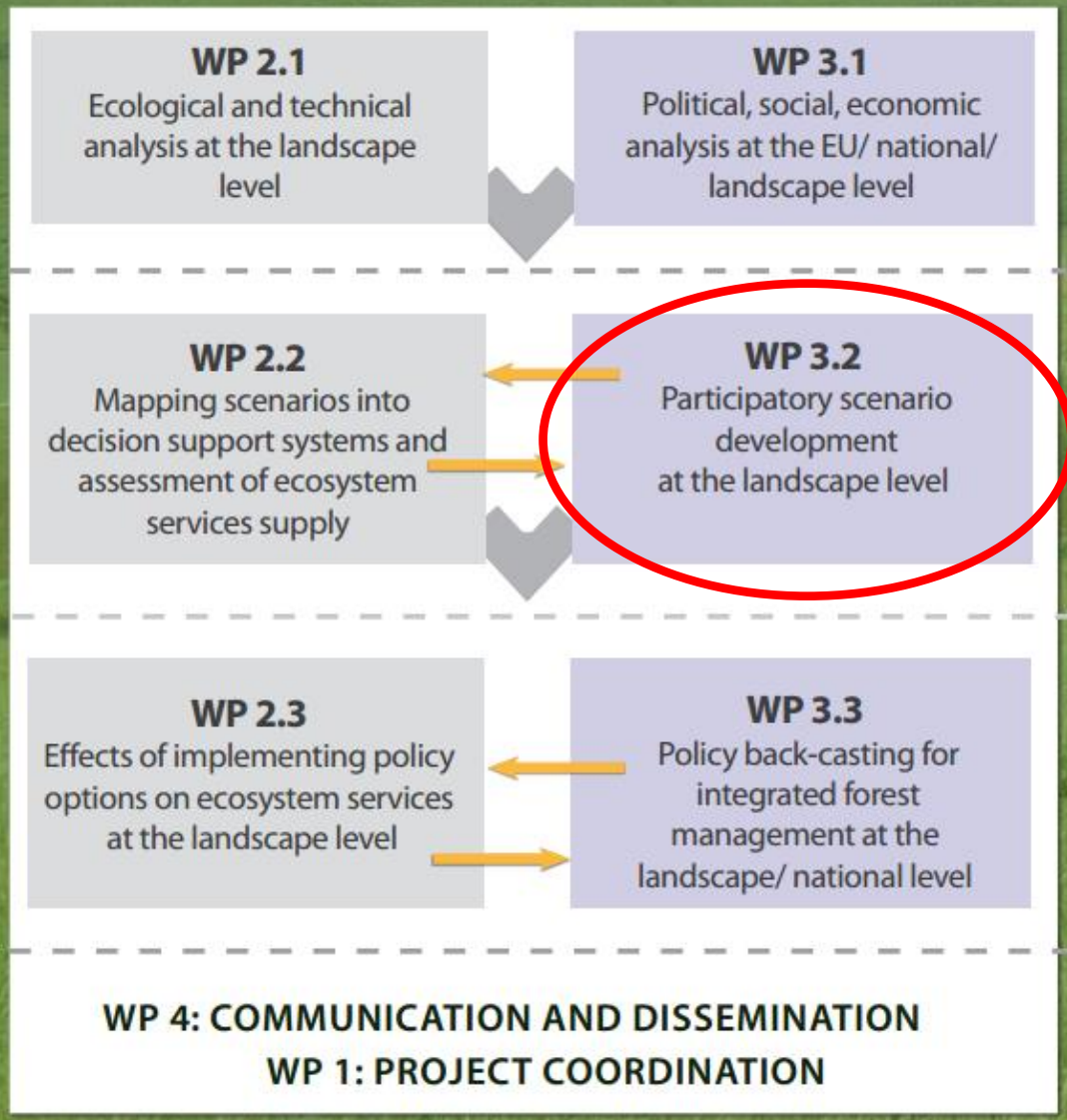
integral Future-oriented integrated management of European forest landscapes

SEVENTH FRAMEWORK PROGRAMME

Main idea

... major discrepancies between social perspectives and demands have been reflected in incoherent policy objectives, inconsistent instruments and management approaches for the conservation and sustainable management of forest ecosystems in the EU and the Member States...

INTEGRAL PROJECT STRUCTURE



integral Future-oriented integrated management of European forest landscapes

Inovativnes and multidisciplinarity

Application of the sophisticated methodologies and technolgy.

Tendency from description to the prescription (strategic prognosing, spatial decision support).

Social dimension and participativity

Relevant stakeholders participation in the solution (owners, managers, state administration, other groups).

Questionaries, workshops, interviews.

Internationality and multisectorality

Common EU methodology, politics, legislative, management.

integral — Future-oriented integrated management of European forest landscapes

http://www.integral-project.eu/

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2013 2014 2015

Project Meeting
Project Partner Events

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INTEGRAL is a collaboration project of universities and R&D institutes working on solutions for better forest management in Europe.

Background

In the European Union, the important environmental and socio-economic roles of forests are widely known. However, there are critical incoherencies between the forest-related policies at the European level and their implementation in the regions in the member states.

Goals

The main objective of the four-year project INTEGRAL is to bring the landscape dimension closer to Europe. At the same time,the project provides demand-driven information for European policy decision makers on the challenges in forest management in 20 regions throughout Europe.

INTEGRAL provides solutions for:

- effective management strategies at the landscape level
- decision support tools for future-oriented and integrated forest management
- coherent EU policy instruments

[+] Further information about the **INTEGRAL** Project

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