Universität für Bodenkultur Wien
Department für Wald- und Boden-
wissenschaften

Past, current and future drivers for the development of Decision Support Systems in forest management

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overview

- **Drivers for DSS development**
  - **forest management demands**
  - **Methodological advances**
  - **Technology drivers**
- **the current state of DSS**
- **Conclusions on further developments**

DSS pioneers

RALPH H. SPRAGUE

most cited framework article on
Decision Support Systems
in the 1980's

CLYDE W. HOLSAPPLE

Linking Knowledge management
with decision support systems
(2-volume Handbook)

ANDREW B. WHINSTON

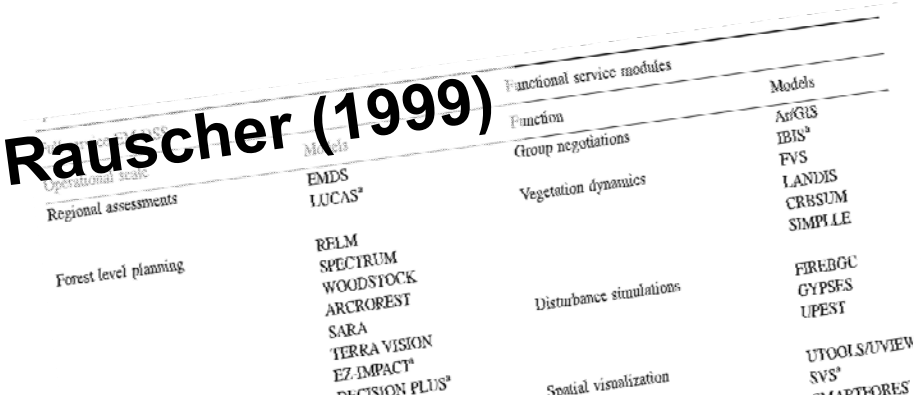
founding Editor-in-Chief of
Decision Support Systems
journal

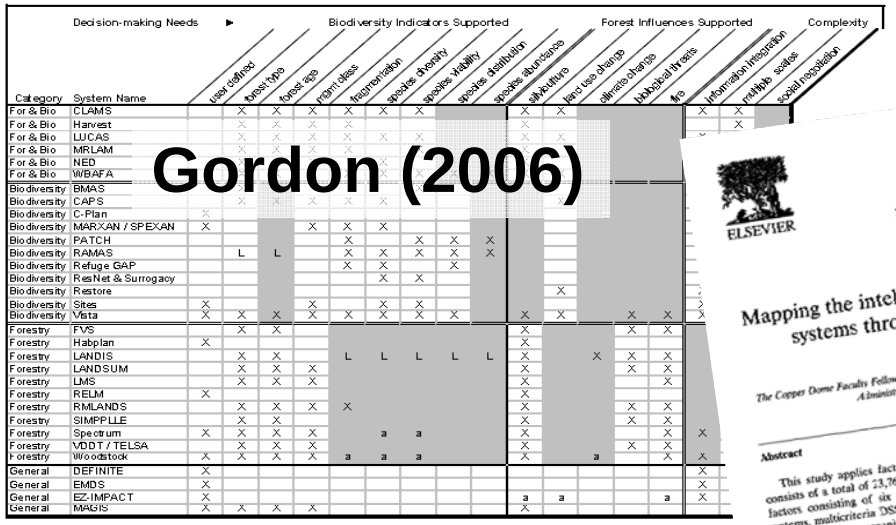
EFRAIM TURBAN

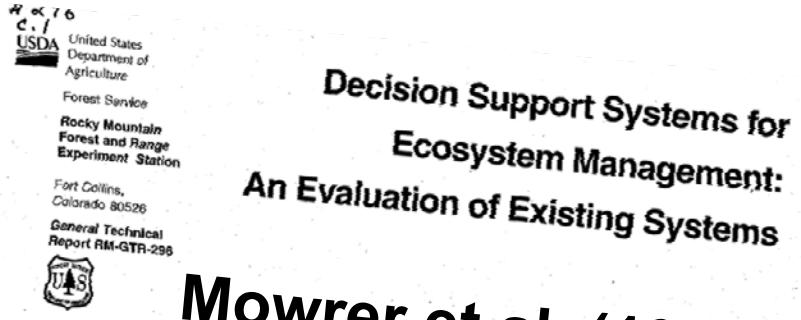
application of computer technology
to business and financial decision making

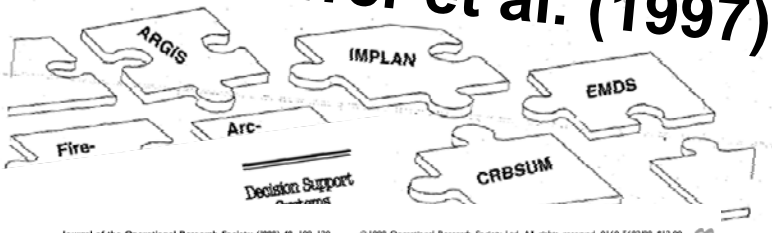
ROBERT H. BONCZEK (*)

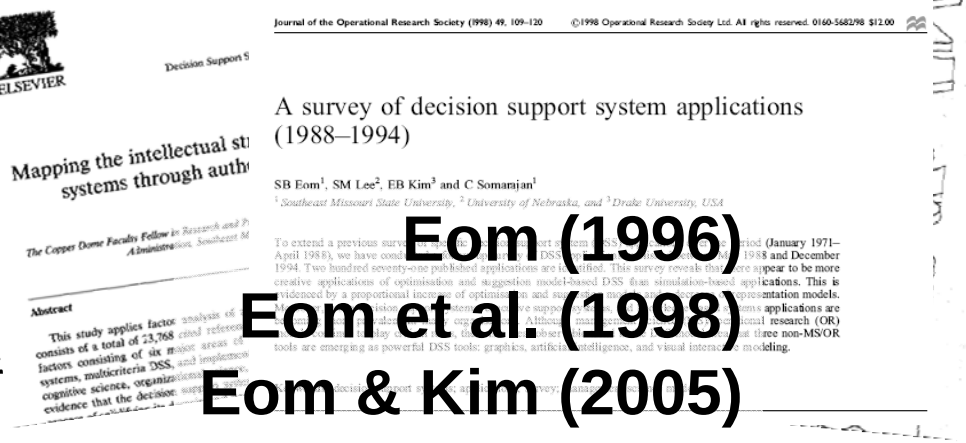
Several reviews have been conducted…





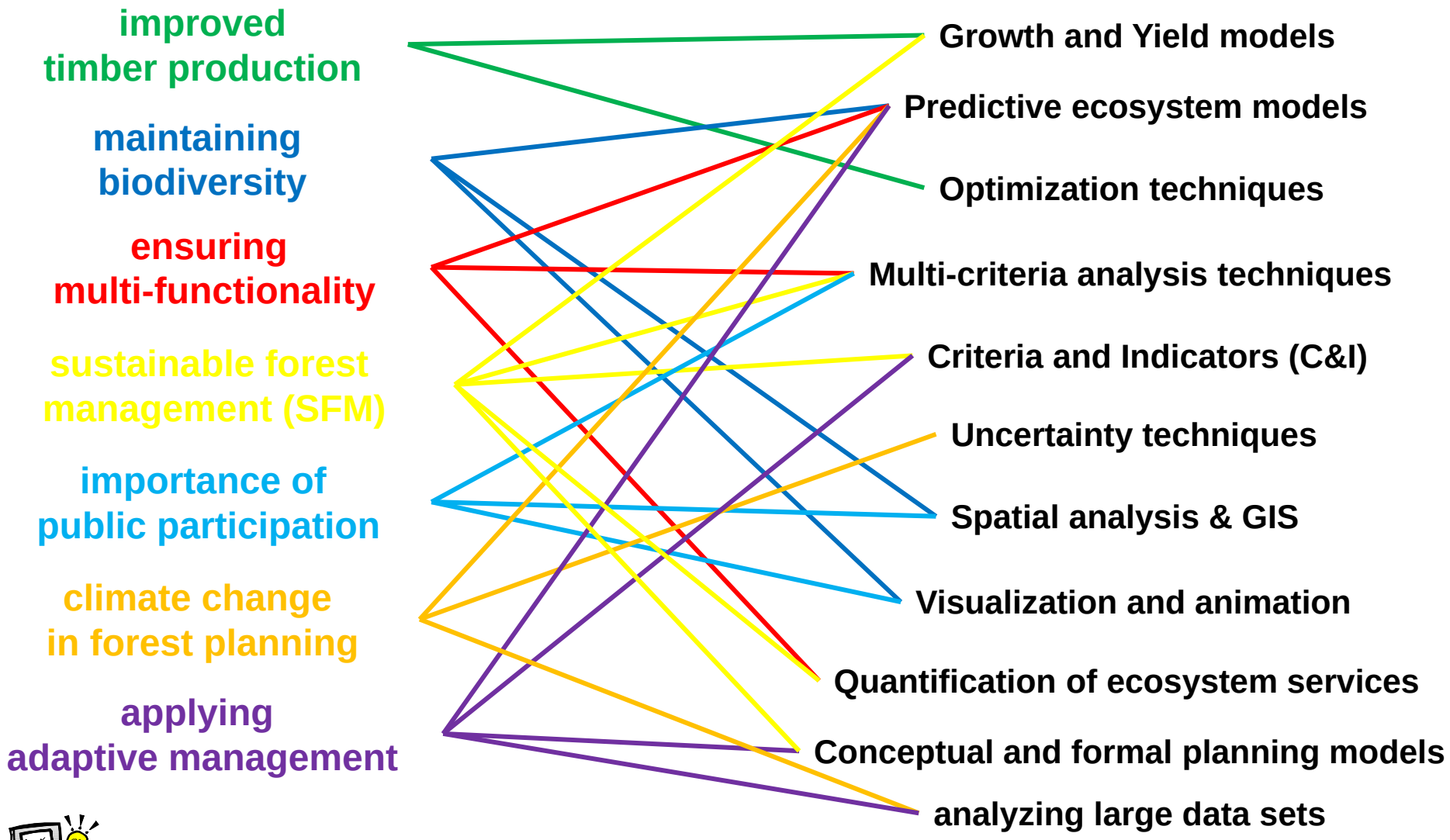






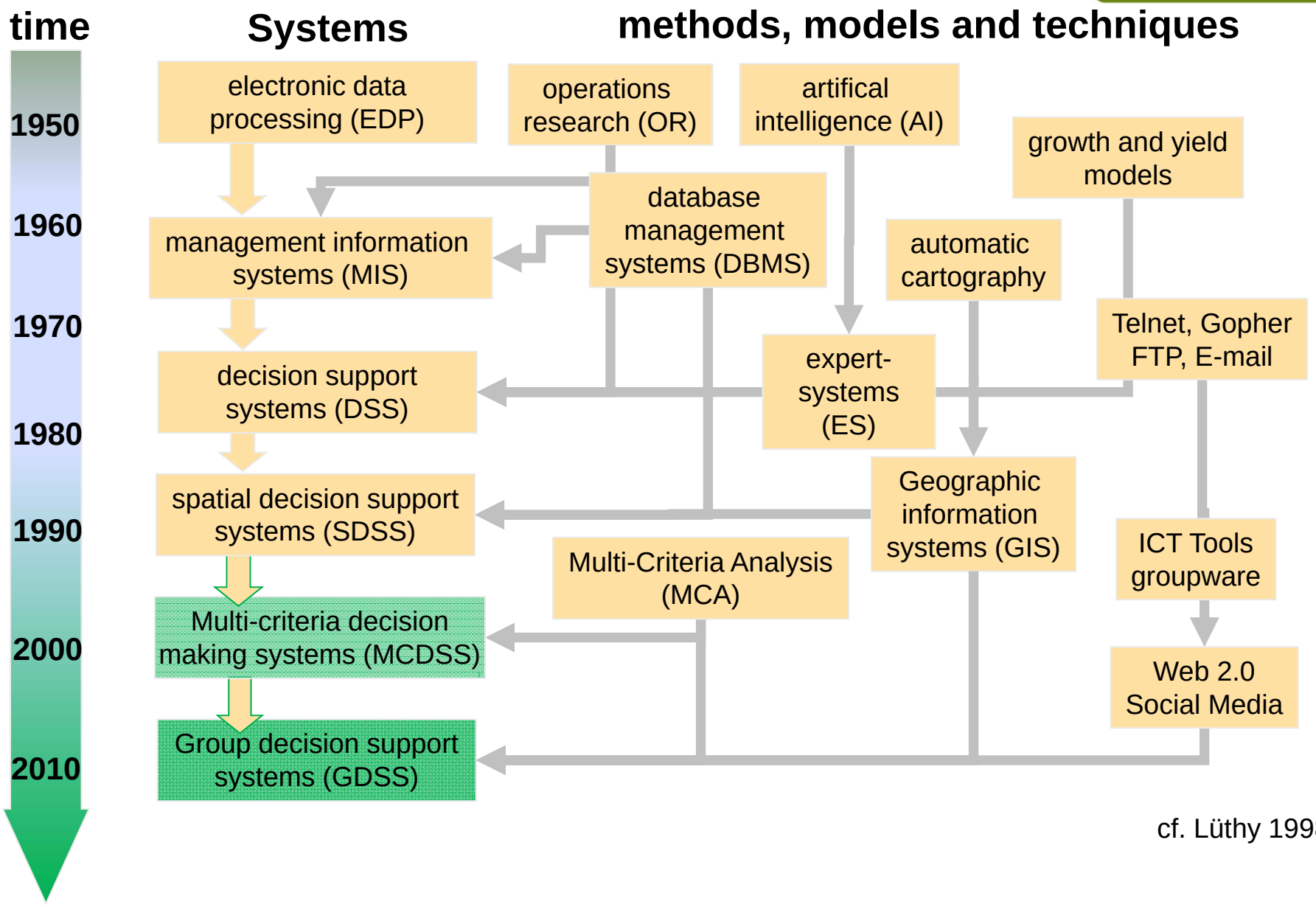
and many more to come….

Forest management demands



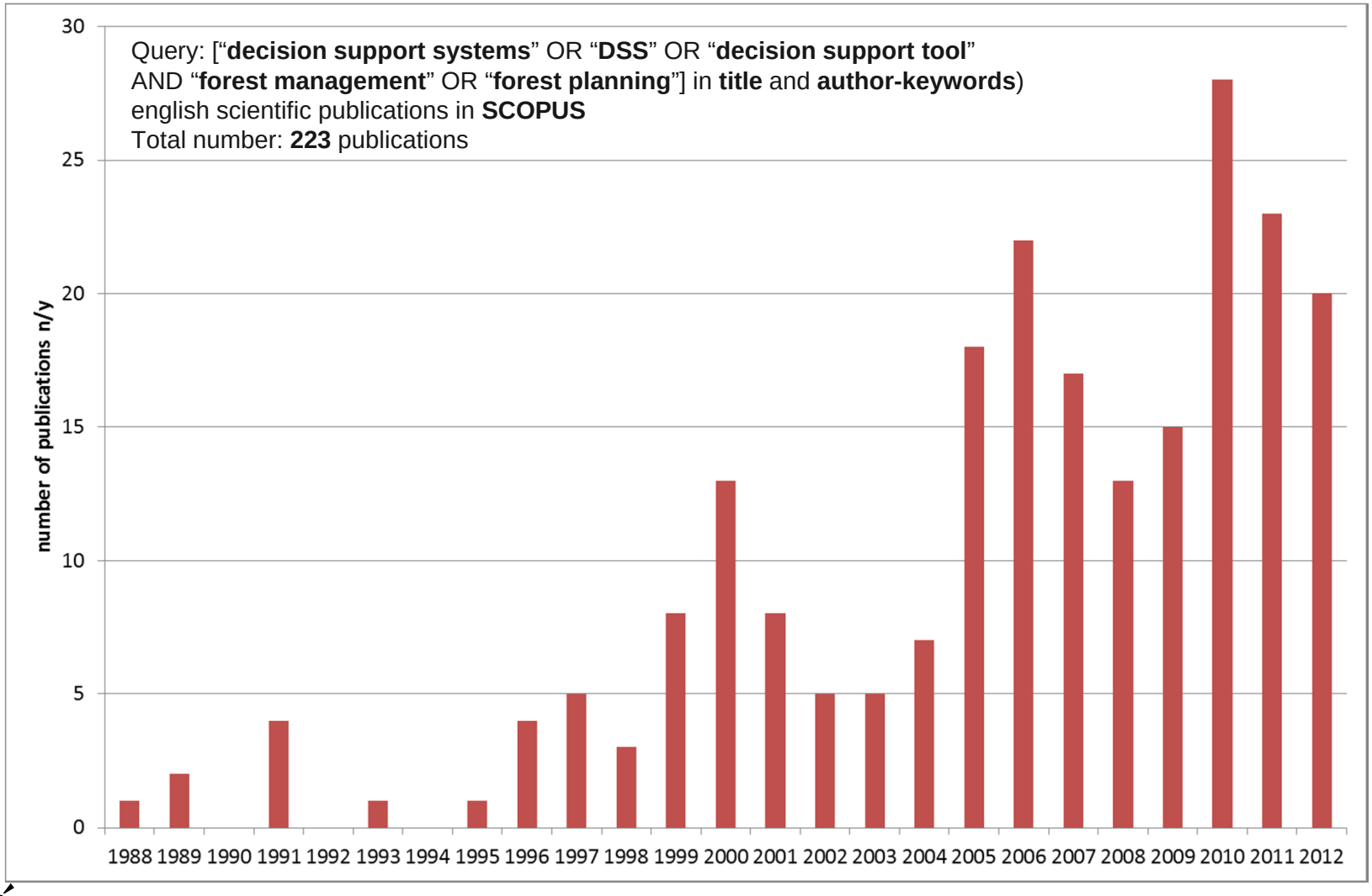
methods and technology drivers

a historical perspective...



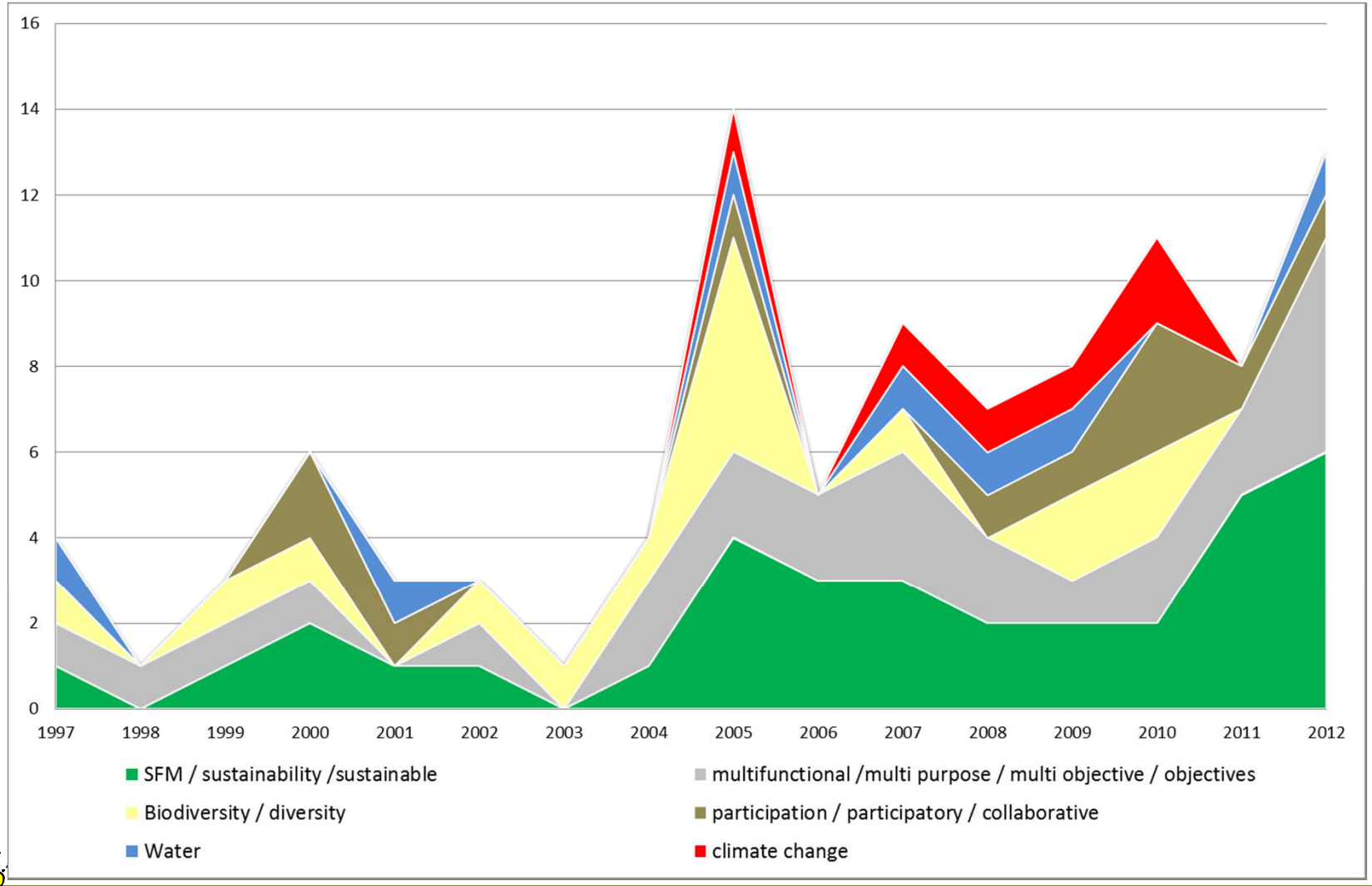
cf. Lüthy 1998

Evidence from literature



Forest Management topics

issues adressed in publications

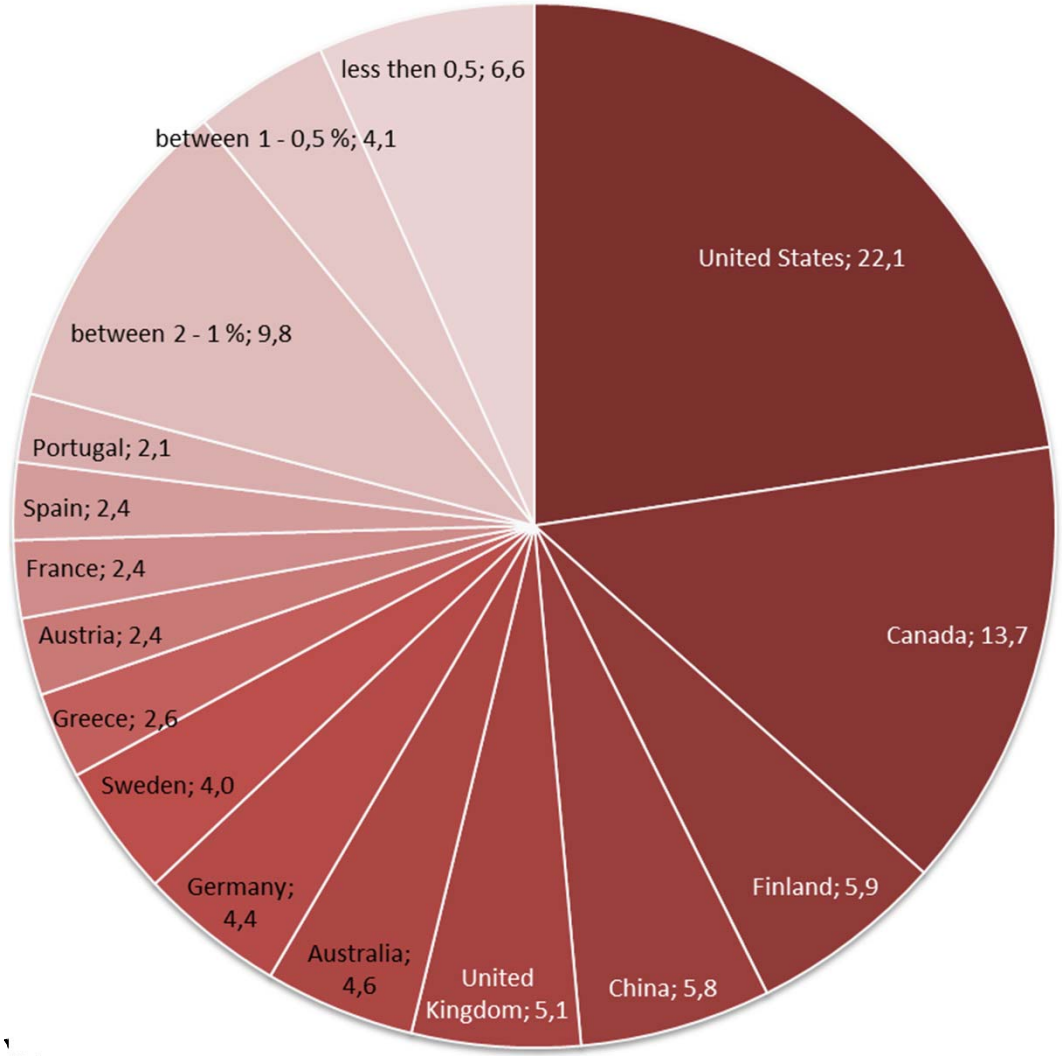


descriptive analysis of papers

(top word counts of 223 analyzed abstracts)

among the top 100: model, data, information, tools, analysis, development, spatial, process, GIS

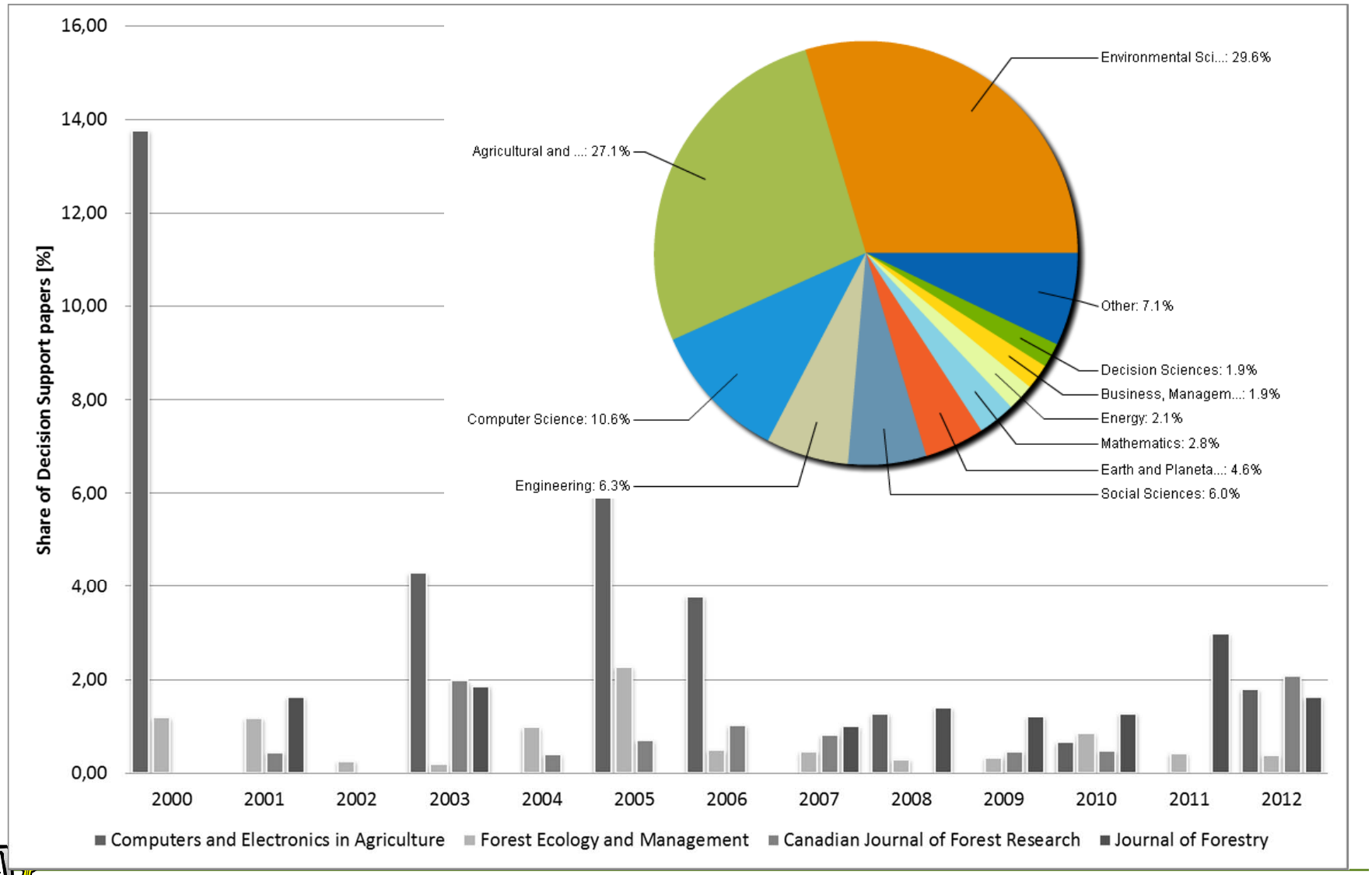
Countries of orign



Europe (43,4%)
United States (22,1%)
Canada (13,7%)
Australia (4,5%)

(Finland (5,9%),
United Kingdom (5,1%)
Germany (4,4%)
Comprise highest number of papers in Europe)

Representation of DSS in journals



Summary on current state

Model-Driven DSS‘s
no need for large data sets,
use of quantitative models

Data-Driven DSS‘s
queries of large data sets, MIS,
EIS, ESS, OLAP

FORSYS

Knowledge-Driven DSS‘s
Interaction between human-computer,
Expert Systems, AI, rule based

Document-Driven DSS‘s
Document retrieval and analysis from large databases, use of web technologies

Communications-Driven DSS‘s
use of ICT, groupware, collaboration, GDSS,

According to Power (2008);
Burstein & Holsapple (2008)

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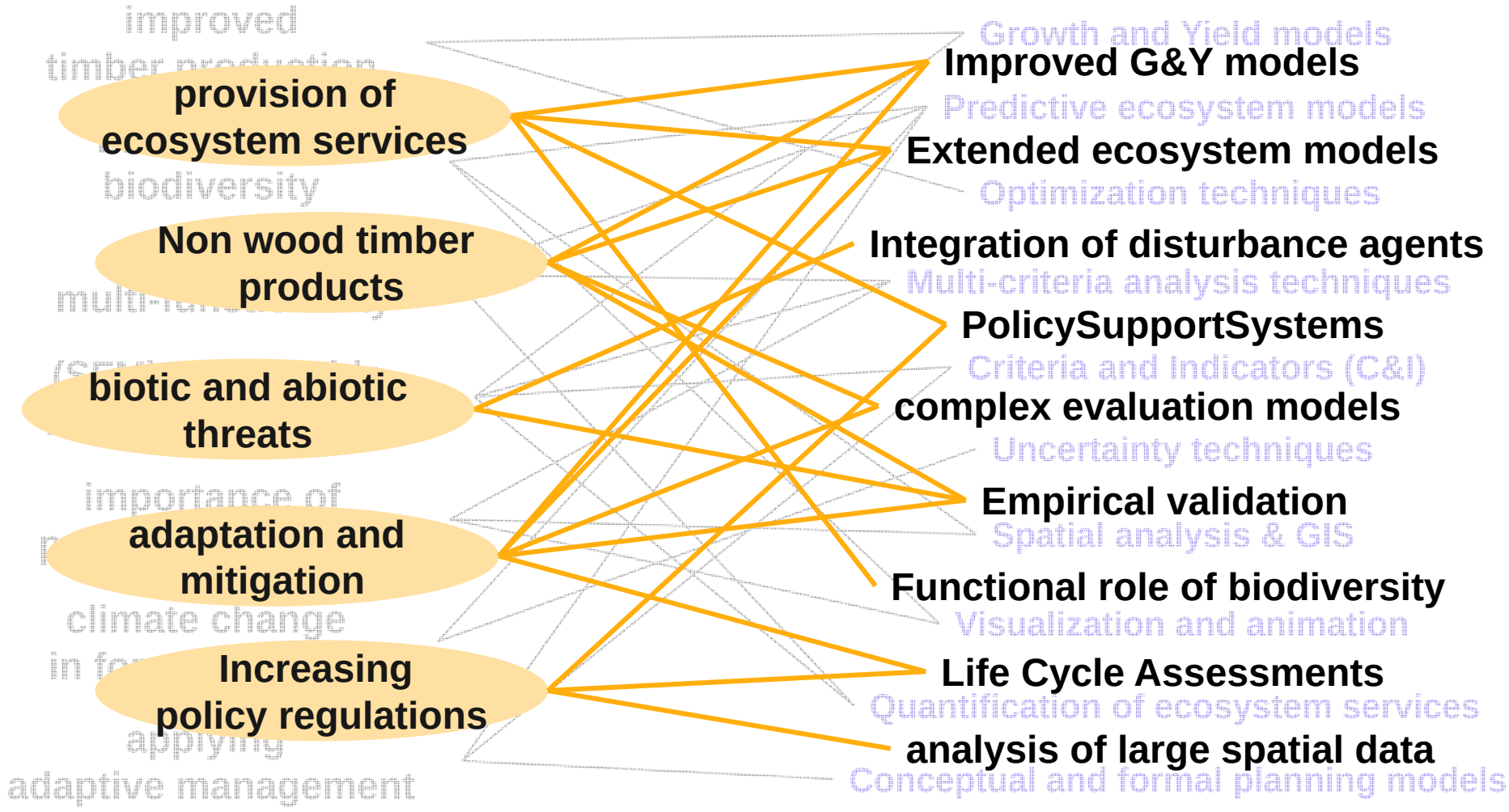
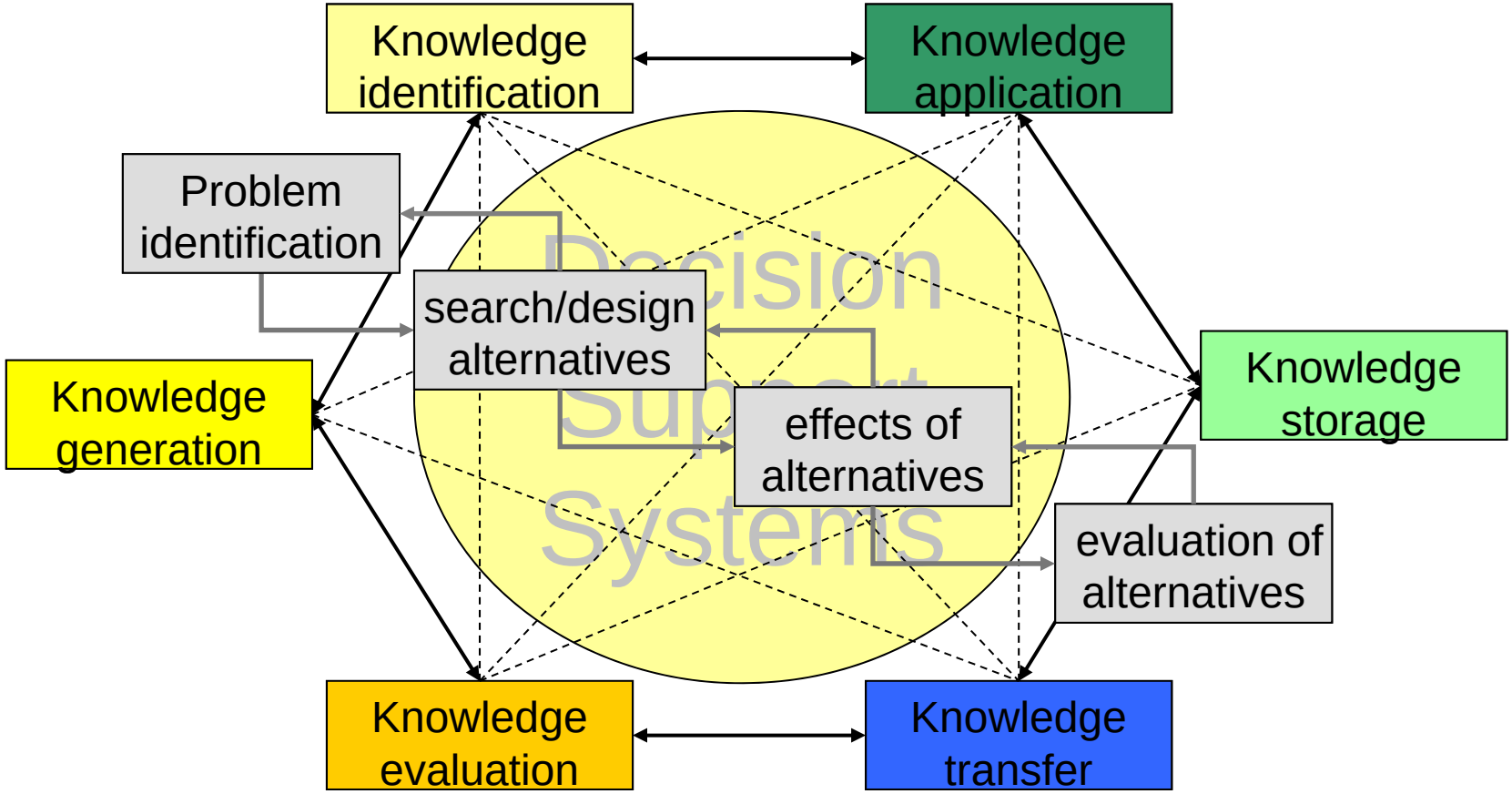
Possible future directions
way ahead for DSS development...

- **forest management demands**
- **Methodological advances**
- **Technology drivers**

Selected future forest management demands



Decision Making Processes



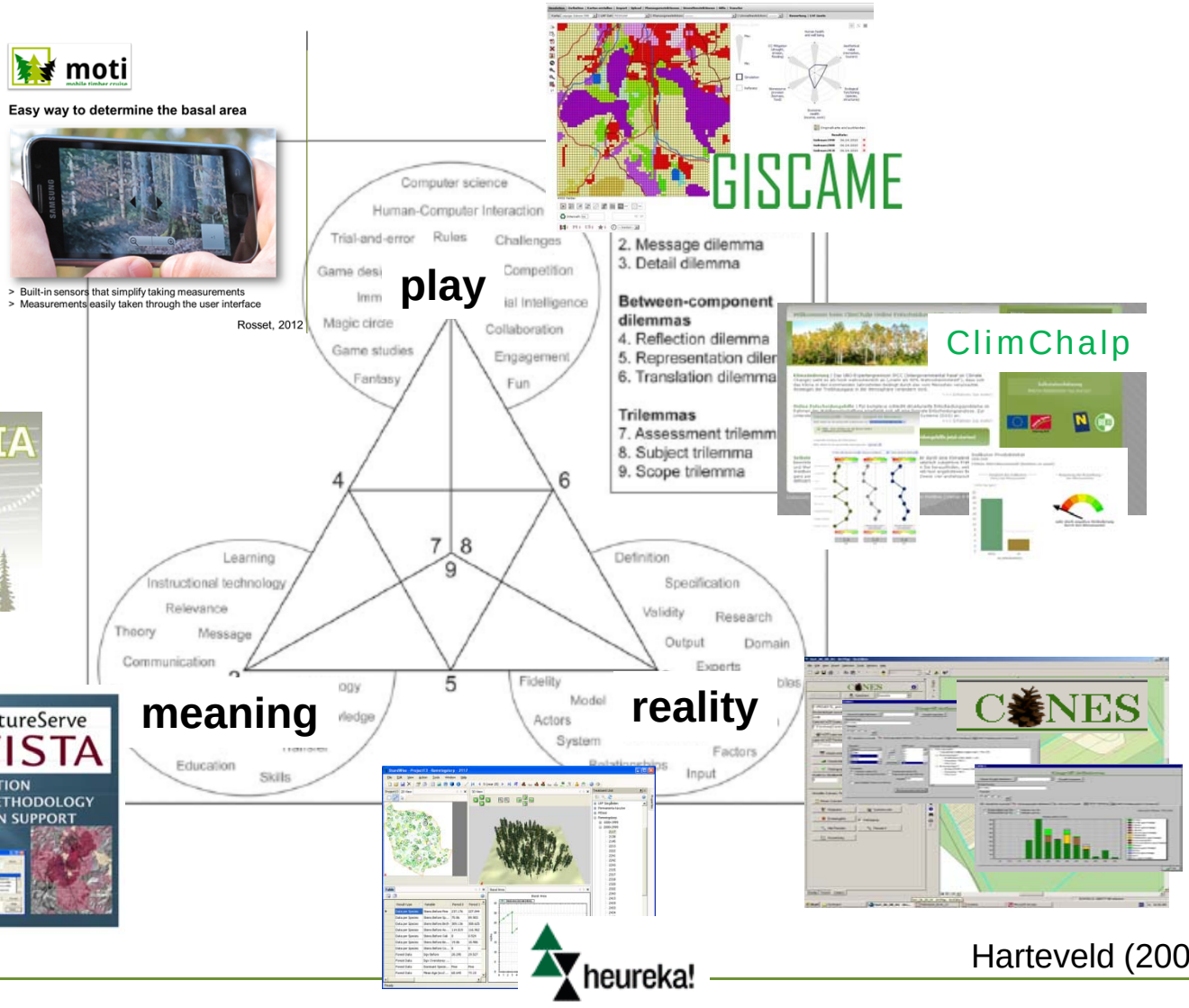
Knowledge Management Processes

Selected future technology drivers…

- Increased **social networking** and shared repositories of digital files (e.g. videos, photos, reports, Google docs, wikis,…)
- widespread **dissemination of expert-profiles** using new media elements (e.g. blogging, chat, LinkedIn, ResearchGate, …)
- **gaming industry** enables socio-technical innovations (e.g. user-controlled avatars, multi-user interaction, 3D animations)
- remote collaborative activities in **virtual worlds** - members of distributed teams can teleport avatars
- Increased provision of **web services** (e.g. spatial analysis not longer limited to GIS experts, MCA without software needs)
- "**internet of things**": connects almost all devices, humans and processes to web – enables services on smartphones that communicate with public and private data

GUI: Simplicity versus complexity

User interaction will become challenging



Harteveld (2009)

Changing user and model demands will stimulate DSS development

- demands for models and methods integrated in DSS will rise and lead to **complex systems**
- requests for **easy and smart tools** making use of available web services will increase
- decision makers will have **different preferences**
  - use multiple DSS-tools, each oriented toward a particular purpose, technique
  - use a single more complex DSS that encompasses multiple purposes, uses different techniques

The ToolBox approach

Web-based

low-barrier access

different types of knowledge

information, examples, FAQs

collection of different tools

vulnerability assessment, MIP optimization, niche models, …

targets different users

useful knowledge for managers (DIY) and analysts (consultants)

Presentation of Rammer et al.
MOTIVE Tool Box

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Thank‘s for your attention!

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