



motive.project-eu



How to provide decision support to practitioners and policy makers the AFM ToolBox approach

Werner Rammer, Christian Schauflinger, Harald Vacik, Kristoffer Kleine, Michael Maroschek, Manfred J. Lexer

Martina Roubalova, Petr Kneblík

Jose Borges, Jordi Garcia-Gonzalez, Joao, Palma, Margarida Tome

Freiburg, 9-10 April 2013



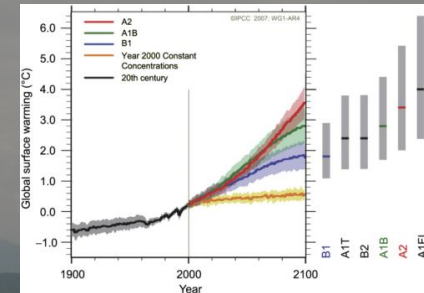
background

Manager/
decision maker



Stakeholder interaction

External drivers



climate change

landuse change

socio-economic conditions



biomass



protection

Photo: Fpa

habitat



recreation



Ecosystem services

vision

■ knowledge transfer

- Background **information** on climate change and related impacts.
- How to address climate change vulnerability and adaptation?
- **Options** to respond in forest management to climate change.
- Learn from **examples** from across Europe.

■ decision support

- provide **access** to tools and functionalities otherwise not available
- **explore** how your preferences & interests affect judgements on vulnerability and the selection of adaptive management actions.
- **optimize** your management plan.

Challenges when designing decision support tools (...)



Hard to target the right users

Foresters? Forest owners? Policy maker? Particularly difficult within EU projects!



Hard to handle complexity

... in knowledge transfer processes

How to simplify vast amount of data & multiple problem dimensions
(space, time, ...)



Hard to produce software

... at high quality standards

multi-project timeframe may allow continuous development

the ToolBox approach



Web-based
low-barrier access



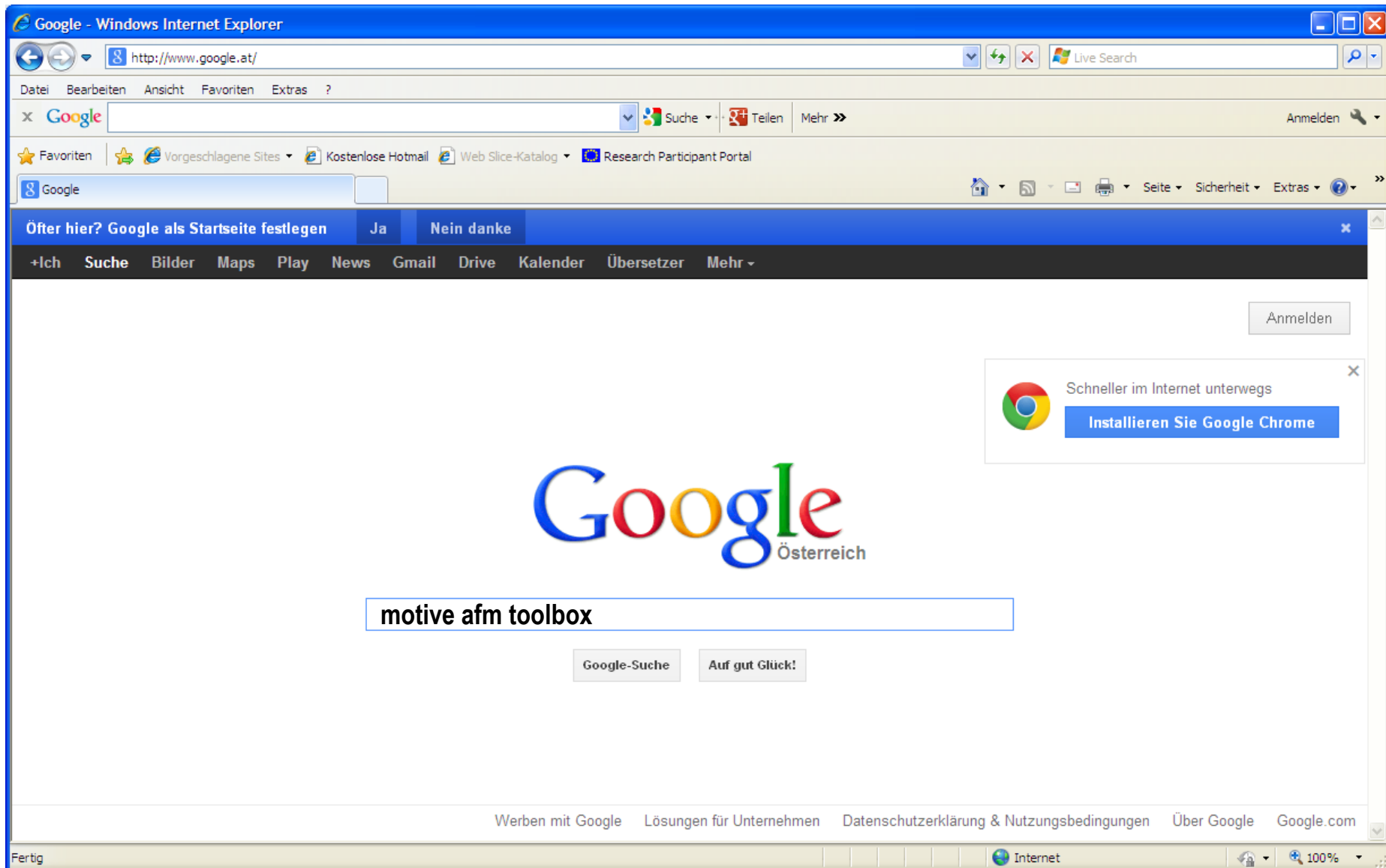
different types
of knowledge
information, examples, FAQs



collection of
different tools
vulnerability assessment, MIP
optimization, niche models, ...



targets different users
useful knowledge for managers (DIY)
and analysts (consultants)



Google

← → ↻ 🔍

Login ⚙️ ▼



AFM-ToolBox
adaptive forest management

home

getting started

adaptive forest management

tools

FAQ

examples

make your own

MANAGING FORESTS FOR THE FUTURE

WELCOME TO THE ADAPTIVE FOREST MANAGEMENT TOOL BOX!

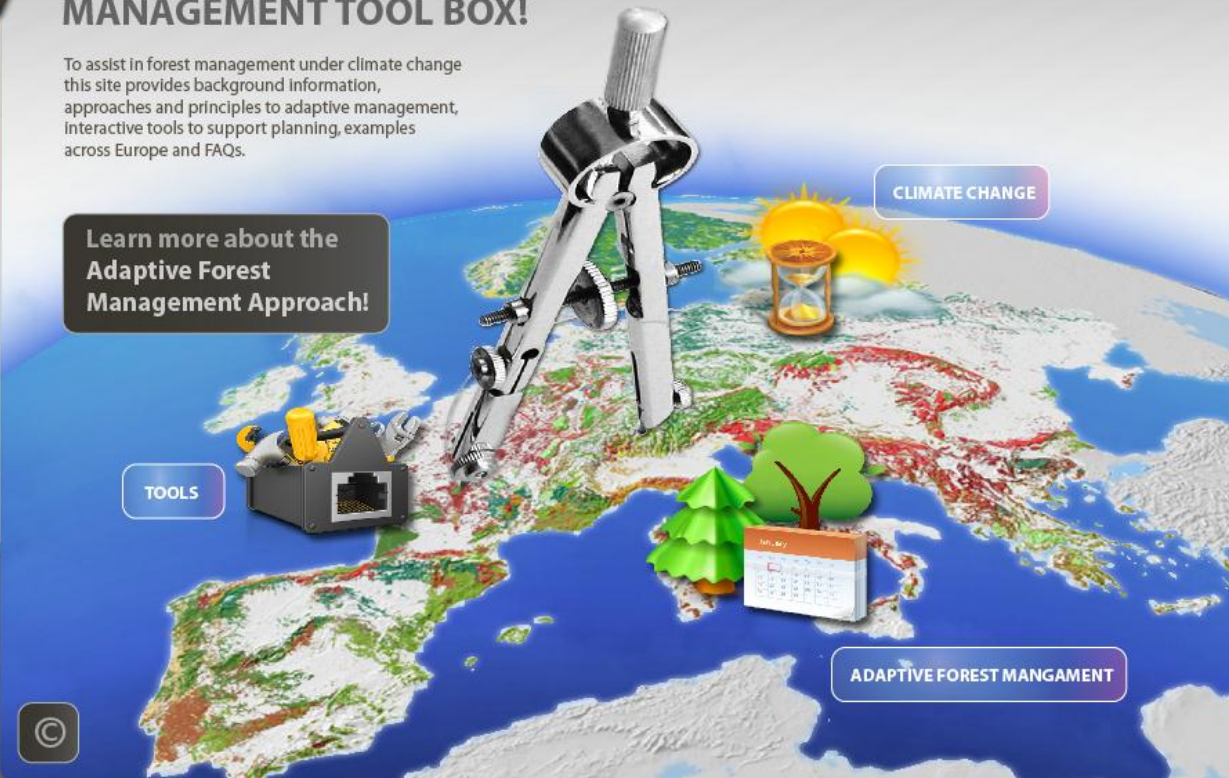
To assist in forest management under climate change this site provides background information, approaches and principles to adaptive management, interactive tools to support planning, examples across Europe and FAQs.

Learn more about the Adaptive Forest Management Approach!

TOOLS

CLIMATE CHANGE

ADAPTIVE FOREST MANGAMENT



©

search



This project is supported by the European Commission under the Environment (including climate change) Theme of the 7th Framework Programme for Research and Technological Development



Institute of Silviculture | Manfred J. Lexer

**AFM-ToolBox**
adaptive forest management

MANAGING FORESTS FOR THE FUTURE

You are here: HOME > Adaptive Forest Management Cycle

THE ADAPTIVE FOREST MANAGEMENT CYCLE

Adaptive management is a structured, iterative management process to cope with uncertainty. the idea is that management actions are taken in a way (PLAN, ACT) that an eventual failure to meet the objectives is not irreversible, that the reasons of failure can be detected in periodic evaluations (MONITOR, EVALUATE) through monitoring of the managed system and that corrective measures can then be set accordingly. To learn more choose a adaptive forest management step below.

[Manager View](#)[Analyst View](#)



[Learn more about the AFM Step "MONITOR" here](#)

CONCEPTS - MONITOR

TOOLS - MONITOR

FAQ - MONITOR

home

getting started

adaptive forest management

tools

FAQ

examples

make your own

search



This project is supported by the European Commission under the Environment (including climate change)
Theme of the 7th Framework Programme for Research and Technological Development



Specific content for steps of the management cycle



home

getting started

adaptive forest management

tools

FAQ

examples

make your own

You are here: [HOME](#) > Adaptive Forest Management Cycle

THE ADAPTIVE FOREST MANAGEMENT CYCLE

Adaptive management is a structured, iterative management process to cope with uncertainty, the idea is that management actions are taken in a way (PLAN, ACT) that an eventual failure to meet the objectives is not irreversible, that the reasons of failure can be detected in periodic evaluations (MONITOR, EVALUATE) through monitoring of the managed system and that corrective measures can then be set accordingly. To learn more choose a adaptive forest management step below.

[Learn more!](#)

Manager View

Analyst View



[Learn more about the AFM Step "PLAN" here](#)

[+ CONCEPTS - PLAN](#)

[+ TOOLS - PLAN](#)

[+ FAQ - PLAN](#)

search



This project is supported by the European Commission under the Environment (including climate change) Theme of the 7th Framework Programme for Research and Technological Development



[←](#)
[→](#)
[↻](#)

[Login](#)




AFM-ToolBox

adaptive forest management

MANAGING FORESTS FOR THE FUTURE

[home](#)
[getting started](#)
[adaptive forest management](#)
[tools](#)
[FAQ](#)
[examples](#)
[make your own](#)

[Manager View](#)
[Analyst View](#)



[Learn more about the AFM Step "PLAN" here](#)

+

CONCEPTS - PLAN

+

TOOLS - PLAN

-

FAQ - PLAN

-

HOW SHOULD WE IDENTIFY THE NEED TO ADAPT?

Planning approaches and tools developed by research teams are often not fully utilized in practice. Reasons are: (a) knowledge transfer processes are not well developed; (b) tools and approaches developed by science are not useful for practice, and (c) there are few – if any – climate change adaptation governance guidelines available by the concerned authorities at national and regional levels which are essential pre-requisites for the quick uptake of new knowledge by practice. In both cases more participative interaction at the user-science interface is required to improve the practice of assessment and planning procedures.

A practical approach could look like this: a vulnerability assessments can be quantitative model-based, qualitative based on expert and stakeholder



 Google

[←](#) [→](#) [↻](#)

Login 

 **AFM-ToolBox**
adaptive forest management

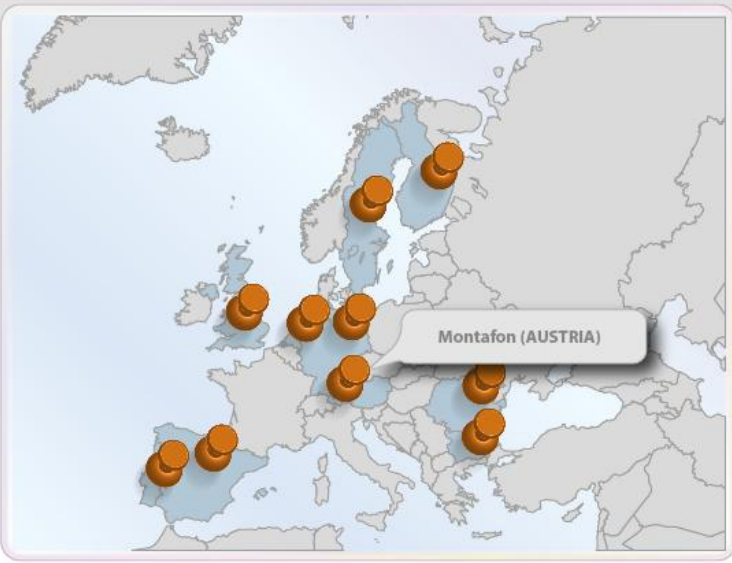
MANAGING FORESTS FOR THE FUTURE

[home](#)
[getting started](#)
[adaptive forest management](#)
[tools](#)
[FAQ](#)
[examples](#)
[make your own](#)

You are here: [HOME](#) > regional examples

REGIONAL EXAMPLES

Click on one of the casestudy regions in the map below, to show more details for each casestudy region!
An in-depth coverage of each casestudy can be found on following the link "Learn more!"



Montafon (AUSTRIA)



The Montafon case study is located in Austria in the western Province of Vorarlberg at the border to Switzerland. The case study is part of the Montafon Valley, situated in an alpine landscape in the Eastern Alps. The valley floor is densely populated.

Regional economy is based on tourism (skiing in winter, hiking and mountaineering in summer) dairy farming on grasslands and mountain pastures, and forestry.

[Learn more!](#)

search



This project is supported by the European Commission under the Environment (including climate change)
Theme of the 7th Framework Programme for Research and Technological Development





AFM-ToolBox
adaptive forest management

home

getting started

adaptive forest management

tools

FAQ

examples

make your own

MANAGING FORESTS FOR THE FUTURE

You are here: HOME > regional examples > Montafon (Austria)

MONTAFON (AUSTRIA)

- FORESTS

More than two thirds of the valley is forested. The case study focuses on the forests of the Stand Montafon, a forest management unit with 6470 ha of forest. The forests are dominated by Norway spruce (96% of growing stock) and European silver fir (3%) with some admixed European beech, Scots pine and European larch (see the major forest types in Figure 1). The largest part of the forest is located above 1200 m.a.s.l. on steep slopes which makes management difficult and requires skyline based logging techniques. Timber production is a relevant business supporting regional sawmills with rawmaterial and local residents regarding to historic timber rights. Most of the forests serve also protective functions against gravitational natural hazards, like snow avalanche, rock fall, landslide, debris flows, erosion, and flooding.

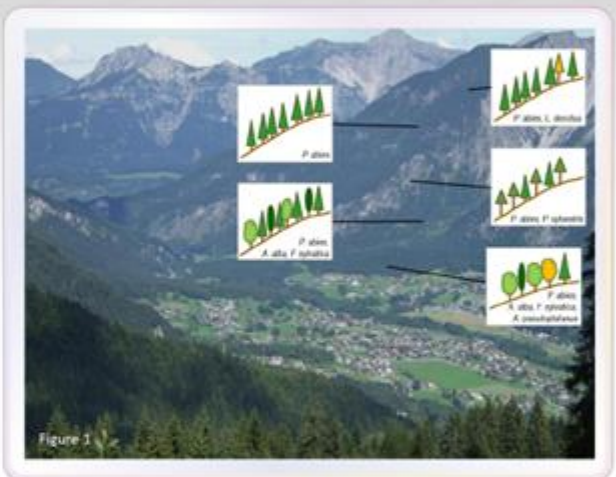


Figure 1

+ FORESTS IN THE MONTAFON

+ CURRENT CLIMATE AND CLIMATE CHANGE SCENARIOS

+ WILL THE RISK PROFILE OF TREE SPECIES CHANGE UNDER CLIMATE CHANGE?

+ ARE TREE SPECIES IN THE FOREST SENSITIVE TO CLIMATE CHANGE?

search




This project is supported by the European Commission under the Environment (including climate change)
Theme of the 7th Framework Programme for Research and Technological Development





AFM-ToolBox

adaptive forest management

MANAGING FORESTS FOR THE FUTURE

You are here: [HOME](#) > Tools

TOOLS INSIDE THE AFM TOOL BOX

Learn more about the tools provided by the toolbox by clicking on the "Learn more"-Button in the overview below. To directly start a specific tool use the "Start the Tool"-Button.

home

getting started

adaptive forest management

tools

FAQ

examples

make your own



VULNERABILITY-ASSESSMENT (BASIC)

The vulnerability assessment tool utilizes a multi-criteria technique to assess the effects of climate change and alternative management regimes on a variety of vulnerability indicators. These indicators are weighed and aggregated to the level ecosystem services based on user preferences.

[Learn more!](#) [Start the Tool!](#)



VULNERABILITY-ASSESSMENT (ADVANCED)

The vulnerability assessment tool utilizes a multi-criteria technique to assess the effects of climate change and alternative management regimes on a variety of vulnerability indicators. These indicators are weighed and aggregated to the level ecosystem services based on user preferences.

[Learn more!](#)



VULNERABILITY-ASSESSMENT (COMPLEX)

The vulnerability assessment tool utilizes a multi-criteria technique to assess the effects of climate change and alternative management regimes on a variety of vulnerability indicators. These indicators are weighed and aggregated to the level ecosystem services based on user preferences.

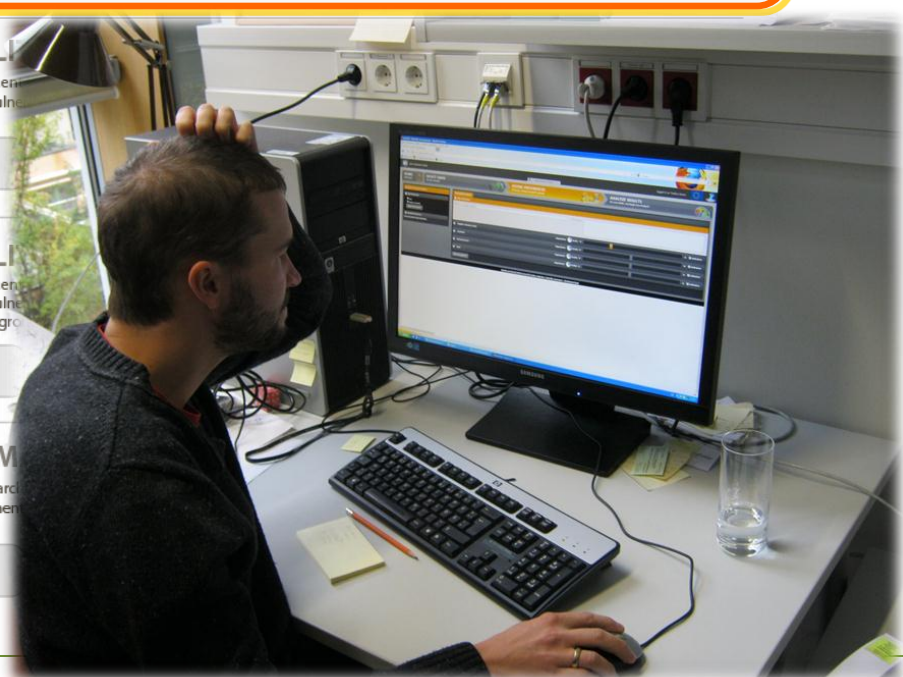
[Learn more!](#)



OPTIMIZED MANAGEMENT

The Optimization Tool searches for the best management plan that assigns a treatment to each tree in a forest stand.

[Learn more!](#)





Select cases from map/ list



Reference Preference Pattern

My Preferences

- test
- timber oriented

Make new Pattern

Default Preferences

Close all panels Open all panels

PREFERENCE EDITOR

Edit a Preference

Title: timber oriented Description:

Indicator	Importance	Value	Indicators
TIMBER PRODUCTION	42.08%		indicators
CARBON	27.32%		indicators
BIODIVERSITY	14.21%		indicators
RISK	16.39%		indicators

Save this pattern!

slidebar to determine preferences

HOME
Dashboard

SELECT CASES
18 cases selected!

DEFINE PREFERENCES
Preference "timber oriented" selected!

ANALYZE RESULTS
Do some Multi- and Single Case Analysis!

ANALYSIS HOME

SHOW CASES

IMPACT ANALYSIS

Getting started with the analysis - Chose your main question below!



What is the predicted impact of climate change under current management (BAU - business as usual)?

Show details!

START ANALYSIS



Choose analysis question....

AFM TOOLBOX HOME

Show Service Panel

logged in as Toolbox Demo



HOME
Dashboard

SELECT CASES
18 cases selected!

DEFINE PREFERENCES
Preference "timber oriented" selected!

ANALYZE RESULTS
Do some Multi- and Single Case Analysis!

ANALYSIS HOME

SHOW CASES

IMPACT ANALYSIS

MULTI-CASE IMPACT ANALYSIS

Show Options

What is the effect of switching to alternative management under climate change?

Choose a period:

by 2020

by 2050

by 2100

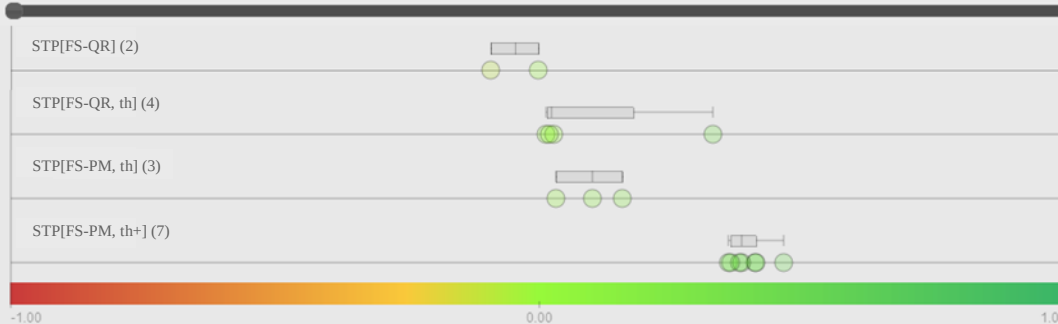
Scenarios:

all available alternate managements

Climate Change: A1B

Ecosystem-Services: Aggregated (total impact)

Zoom-in using the slider:



TOTAL IMPACT
(full scale view)

DETAILVIEW: VULNERABILITY ASSESSMENT FOR A SELECTED CASE

README and RELEASE NOTES for the AFM Toolbox Application "Vulnerability Assessment" - Development Stage!

... and view results



AFM-ToolBox

adaptive forest management

MANAGING FORESTS FOR THE FUTURE

You are here: [HOME](#) > Tools

TOOLS INSIDE THE AFM TOOL BOX

Learn more about the tools provided by the toolbox by clicking on the "Learn more"-Button in the overview below. To directly start a specific tool use the "Start the Tool"-Button.

home

getting started

adaptive forest management

tools

FAQ

examples

make your own



VULNERABILITY-ASSESSMENT (BASIC)

The vulnerability assessment tool utilizes a multi-criteria technique to assess the effects of climate change and alternative management regimes on a variety of vulnerability indicators. These indicators are weighed and aggregated to the level ecosystem services based on user preferences.

[Learn more!](#) [Start the Tool!](#)



VULNERABILITY-ASSESSMENT (ADVANCED)

The vulnerability assessment tool utilizes a multi-criteria technique to assess the effects of climate change and alternative management regimes on a variety of vulnerability indicators. The user can select specific objects for and can control many aspects of the analysis process.

[Learn more!](#) [Start the Tool!](#)



VULNERABILITY-ASSESSMENT (GROUPMODE)

The vulnerability assessment tool utilizes a multi-criteria technique to assess the effects of climate change and alternative management regimes on a variety of vulnerability indicators. In a group setting, a group of users can together elicit preference and interactively analyze the consequences of the groups' preference patterns.

[Learn more!](#) [Start the Tool!](#)

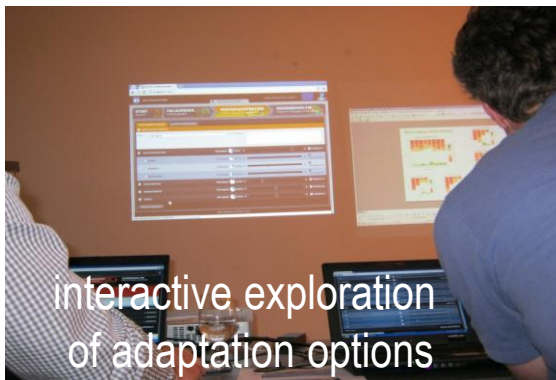


OPTIMIZED MANAGEMENT PLAN

The Optimization Tool searches for an optimal management plan for a forest management unit. The Tool produces an optimized plan that assigns a treatment plan to each of the stands in a unit.

[Learn more!](#) [Start the Tool!](#)

workshop session with local forest managers



AFM TOOLBOX HOME | logged in as Toolbox Demo

Show Service Panel

HOME Dashboard | **SELECT CASES** 26 cases selected! | **DEFINE PREFERENCES** Preference "timber oriented" selected! | **ANALYZE RESULTS** Do some Multi- and Single Case Analysis!

PREFERENCE EDITOR | **GROUP PREFERENCES**

Explore current group preferences

Timber Production

Standing volume

Annual increment

Harvested volume

Carbon

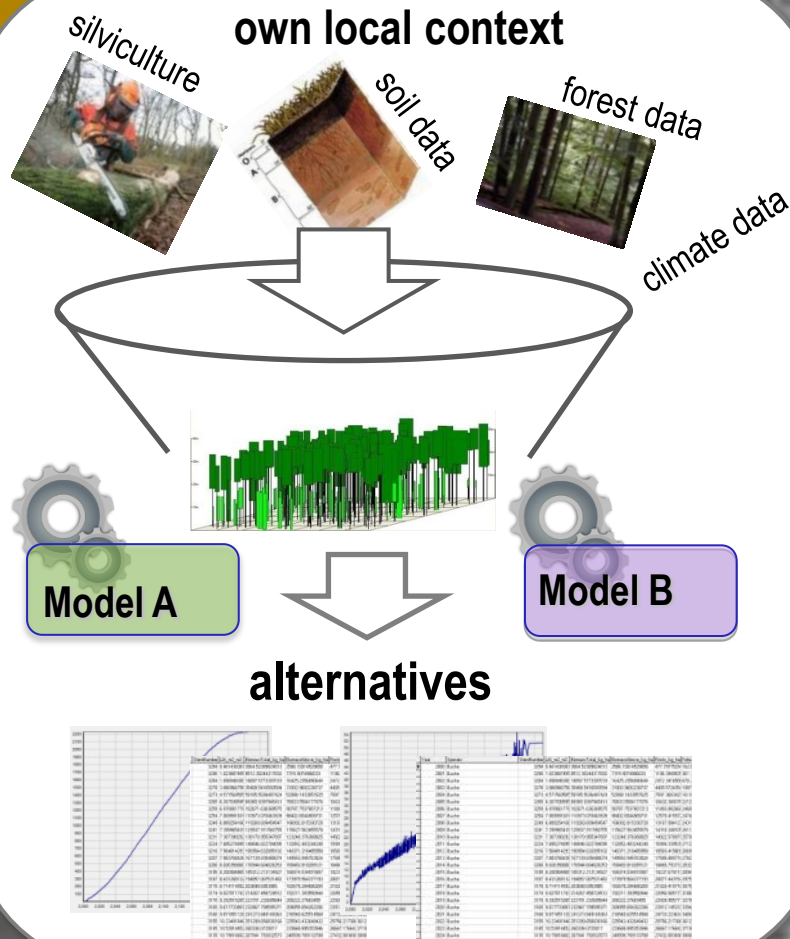
Biodiversity

Protection

your own preference

README and RELEASE NOTES for the AFM Toolbox Application "Vulnerability Assessment" - Development Stage!

„make your own (...)“ - customizing the AFM ToolBox



upload into
DataBase

AFM ToolBox

ToolBox Database



(more) lessons learned

- tools and models to provide decision support are available at science labs
- applying them in a useful & efficient way remains a challenge (for DIY managers and for analysts/experts in consultancy mode)
 - identifying & structuring the problem and agreeing on a decision support process!!
 - communicating and interpreting/ translating model results
 - requires integration of DM tools with KM practices & stakeholder interaction processes
- DIY managers or expert consultancy?
 - **Case specific context** is mandatory for successful decision support
 - *emphasizing integration of tools & software comes to the cost of diversity and flexibility*
 - If **technical complexity** of a decision support process is high
 - *cost of tool integration and standardization may be prohibitive for computerized DSS*
 - *user DIY is impossible, facilitator is required (consultancy)*
 - If **procedural complexity** is high (i.e. intensive SH interaction) a facilitator is required



Thank you!

Contact:

Manfred J. Lexer

University of Natural Resources and Life Sciences, Vienna

Department of Forest and Soil Sciences

Institute of Silviculture

Peter Jordan-Strasse 82, 1190 Vienna, Austria

Tel.: +43 - 1 - 47654 4050

e-mail: mj.lexer@boku.ac.at



**University of Natural Resources
and Applied Life Sciences, Vienna**
Department of Forest and Soil
Sciences

