



Towards Implementing Policy Targets

3 Swiss examples from National to Local

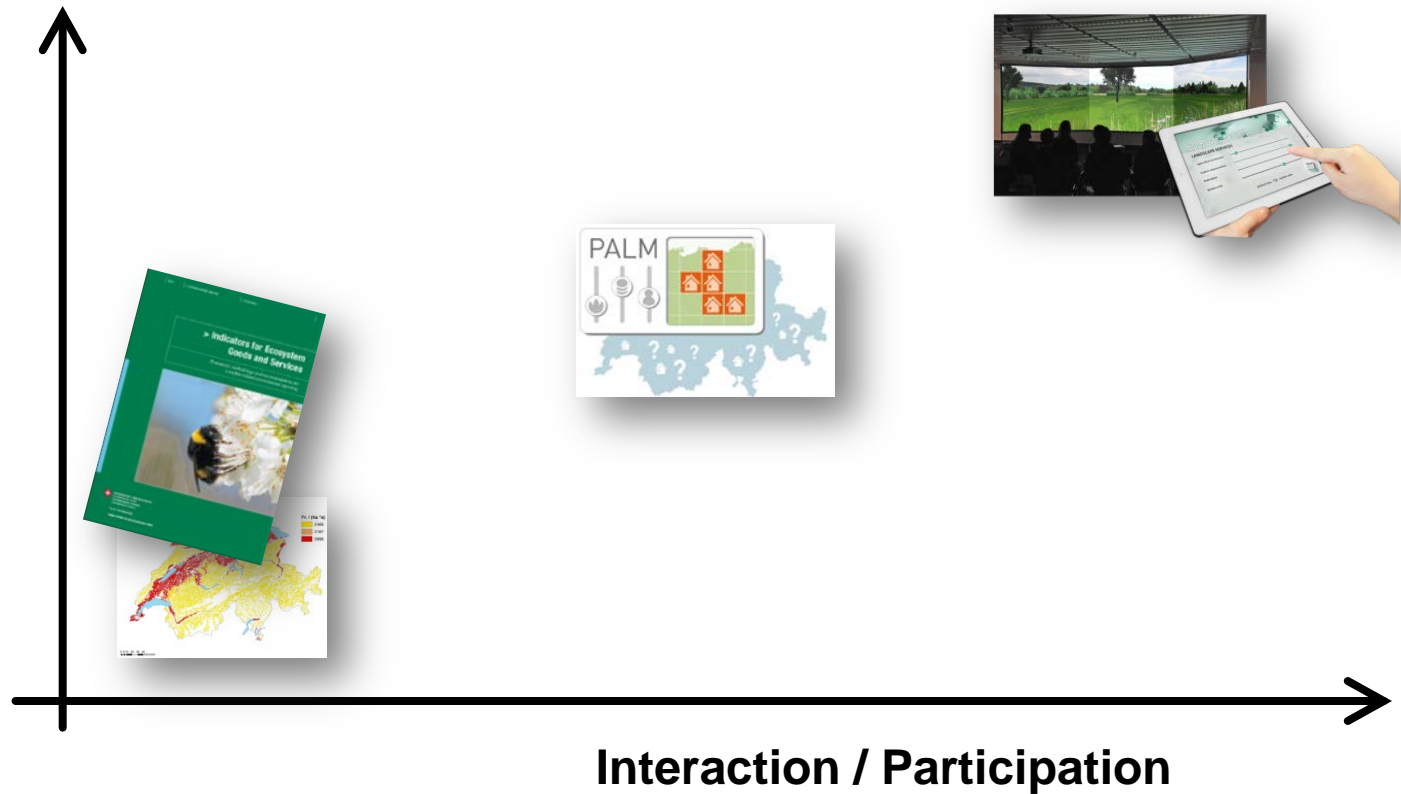
Prof. Adrienne Grêt-Regamey, ETH Zürich, Switzerland
MAES High Level Conference, Brussels

Implementing Policy Targets: 3 examples to highlight the policy relevance of MAES

Local

Regional

National



National - Ecosystem services mapping

(1) Catalogue of 23 FECS and 46 related indicators



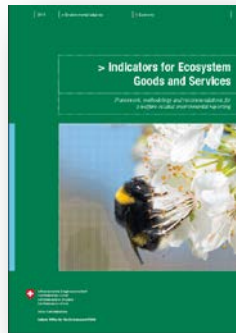
| Final Ecosystem Goods and Services (FECS) | Indicators |
|---|--|
| H3: Recreational services based on recreational spaces in the residential environment (gardens etc.) | I1: Area that could be used for private gardens or for sitting in, playing in and enjoying |
| P1: Natural supply of ground and surface water usable as drinking and process water (input factor for water management) | I1: Water supply from untreated spring and ground water in millions m ³ of water per year |
| | I2: Percentage of untreated spring and ground water in the whole water supply system |

<http://www.bafu.admin.ch/publikationen/publikation/01587/index.html?lang=en>

...for the national energy strategy

Now...

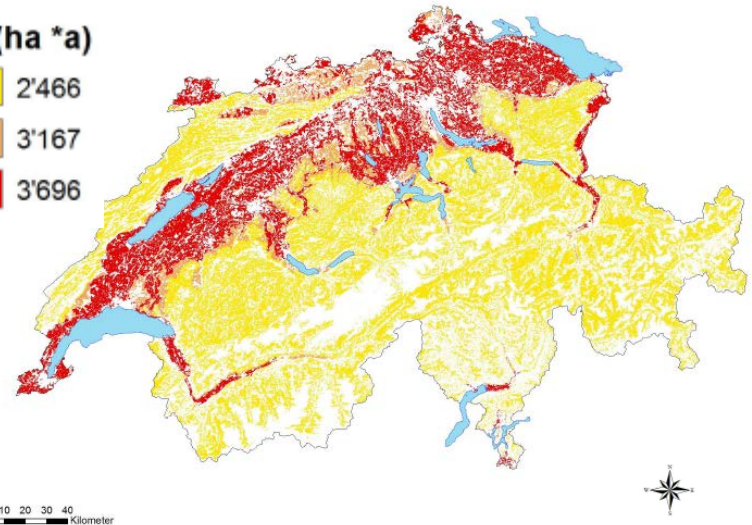
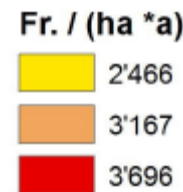
ES Indicators
(FOEN, 2011)



Other indicators
and quantification
approaches
from literature...

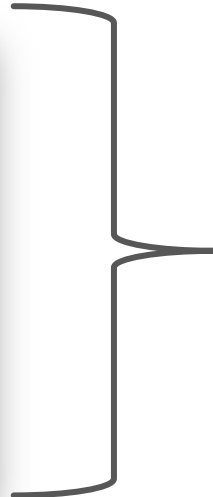
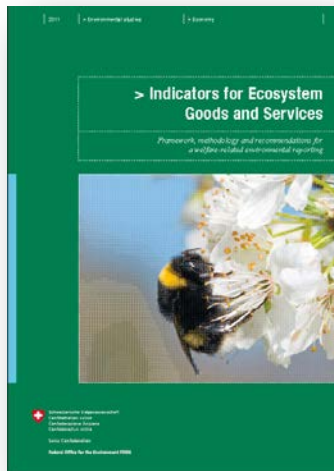


Agricultural Production

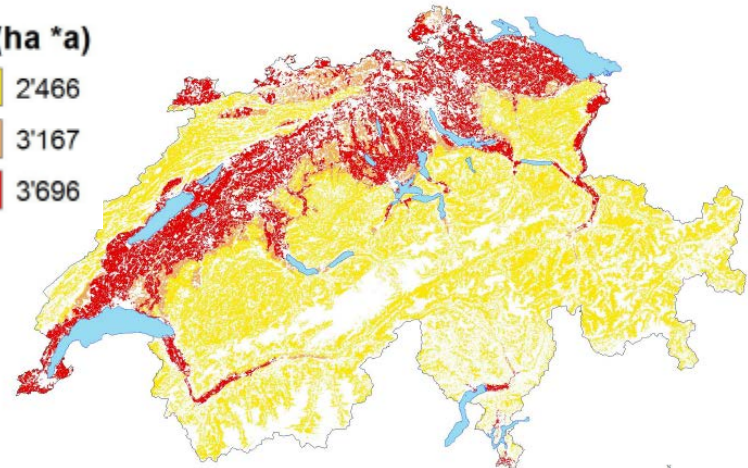
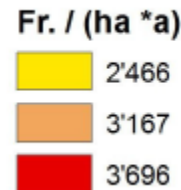


...for the national energy strategy

In the future...



Agricultural Production



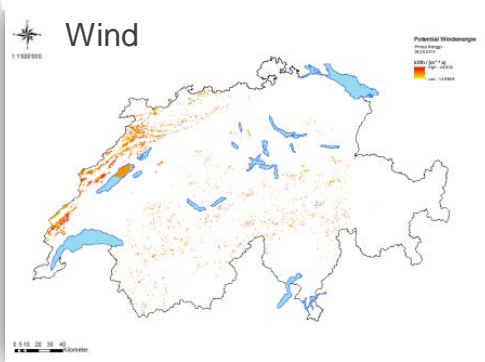
0 5 10 20 30 40
Kilometer



... mapping ES based on indicator set (FOEN, 2011)
Feasibility study in progress

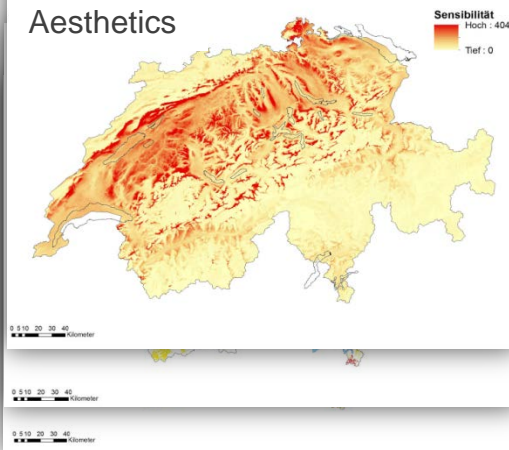
...for the national energy strategy

Energy Potential

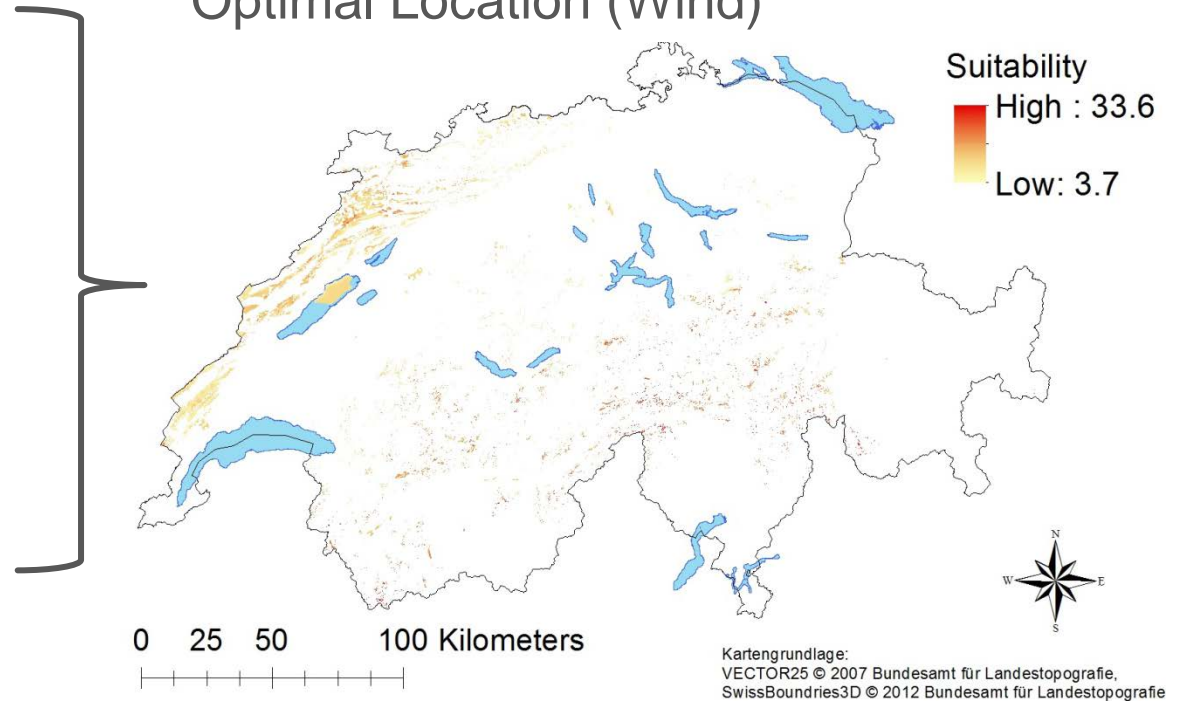


Ecosystem Services

Aesthetics

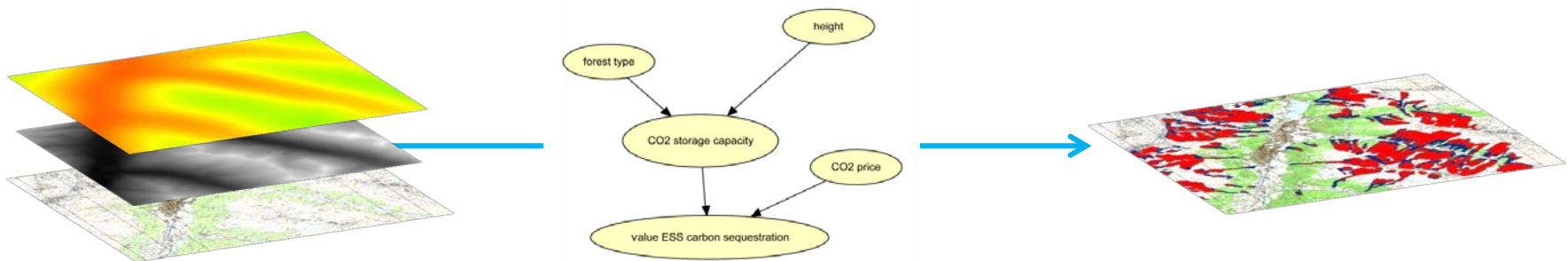


Optimal Location (Wind)



Regional - Ecosystem services mapping

GIS-based process models



GIS Data

e.g. Land use,
temperature, elevation,...

Models

GIS-based process
and valuation models

Ecosystem services

e.g. recreation,
production, carbon
sequestration,...

Grêt-Regamey et al., 2008: Linking GIS-based models to value ecosystem services in an Alpine region.

...for the regional allocation of building zones



PALM 2.0

Intercommunal potential analysis of the resource soil for sustainable land management.

Login English ▾

Pick a username

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Your email address

Sign up for PALM 2.0

By clicking "Sign up for PALM 2.0" you agree to our [Disclaimer](#).



Cooperation

PALM facilitates the intercommunal cooperation of different stakeholders involved in spatial planning.



Application

PALM optimizes the allocation of building zones based on ecological, economic and social criteria.



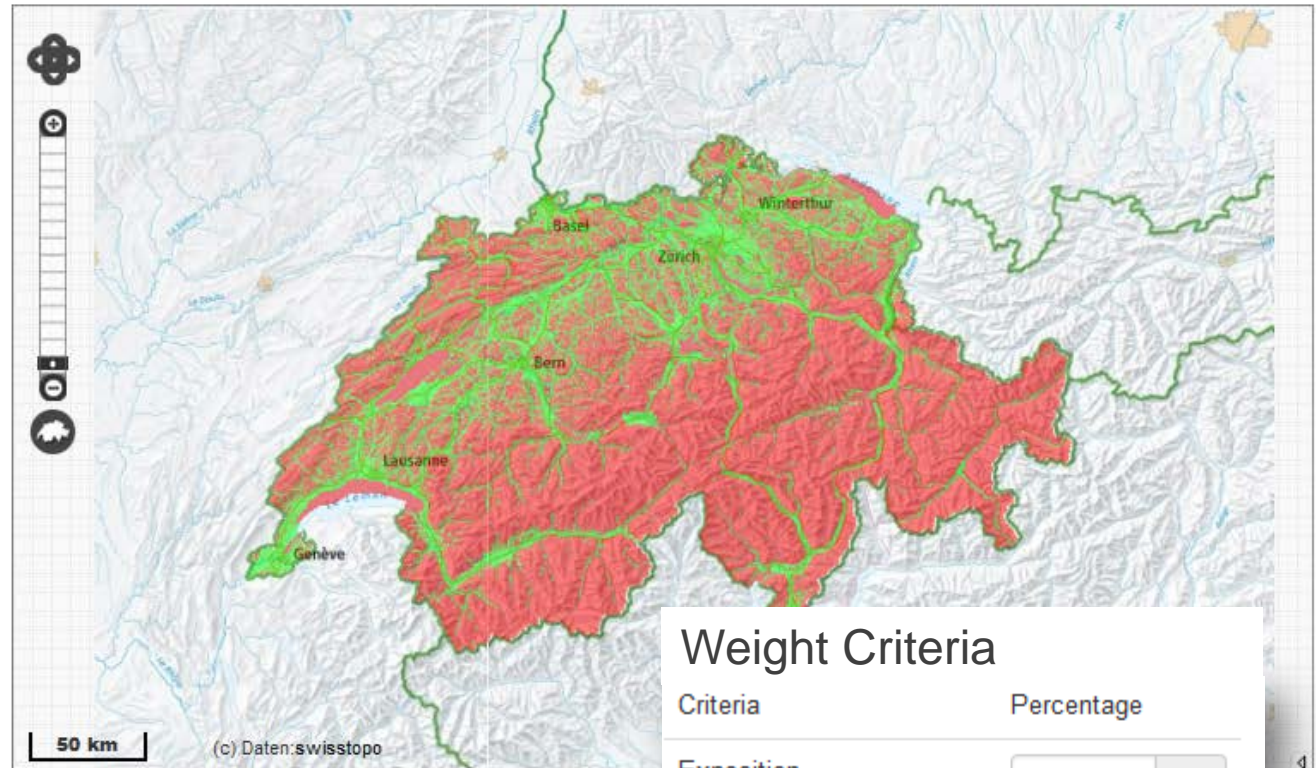
Modeling

PALM processes spatially explicit data in a model to support sustainable land management.

Select criteria

Add one or more criteria to be included in the analysis.

- Food production i
- Groundwater re... i
- Drinking water p... i
- Ecological conn... i
- Public green sp... i
- Quiet recreation... i
- Natural hazards i
- Quiet residential... i
- Exposition i
- Infrastructure for... i
- Infrastructure for... i
- Distance to sett... i
- Distance to utilit... i
- Building costs i



Weight Criteria

| Criteria | Percentage | |
|--------------------------|----------------------------------|--------------------------------|
| Exposition | <input type="text" value="30"/> | <input type="text" value="%"/> |
| Quiet residential areas | <input type="text" value="30"/> | <input type="text" value="%"/> |
| Public green spaces | <input type="text" value="20"/> | <input type="text" value="%"/> |
| Ecological connectedness | <input type="text" value="20"/> | <input type="text" value="%"/> |
| Sum | <input type="text" value="100"/> | <input type="text" value="%"/> |

1. Perimeter

Select perimeter

2. Criteria

Select criteria

3. Weighting

Weight criteria

4. Building zones

Specify size

5. Exclusions

Select exclusions

6. Algorithm

Select algorithm

7. Summary

Start analysis



Altwegg & Grêt-Regamey, 2011, *Challenges in integrating ecosystem services in sustainable land management*

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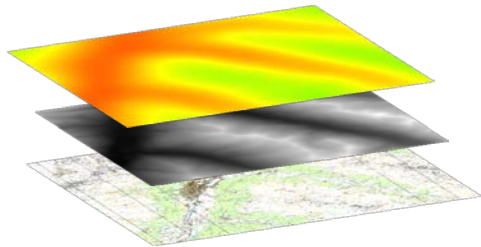
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Altwegg & Grêt-Regamey, 2011, *Challenges in integrating ecosystem services in sustainable land management*

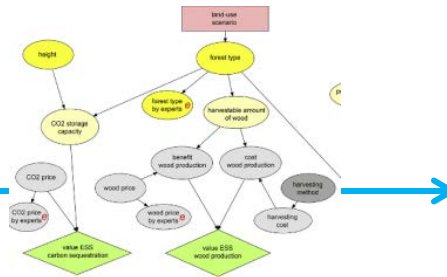
Local - Ecosystem services assessment

Bayesian networks linked to a GIS platform

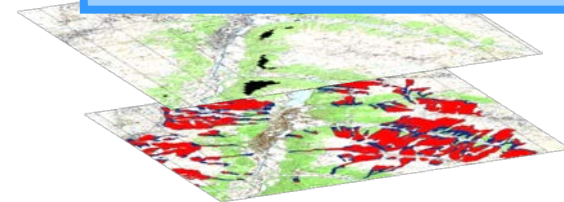


GIS Data

Probability of different forest types



$$ES = \left(\sum_i (prob(LU_i) \cdot ES(LU_i)) \right)$$



Ecosystem services

Value given the **uncertainty** of future forest type



Expert Knowledge



3D-Visualization

Facing uncertainty in ecosystem services-based resource management (Grêt-Regamey et al., 2012)

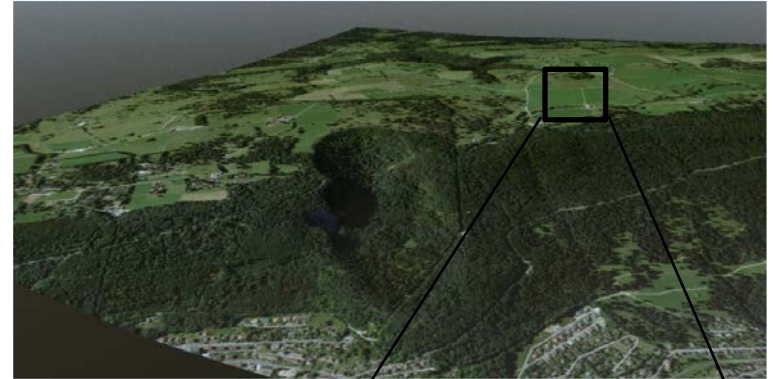
3D-Visualizations



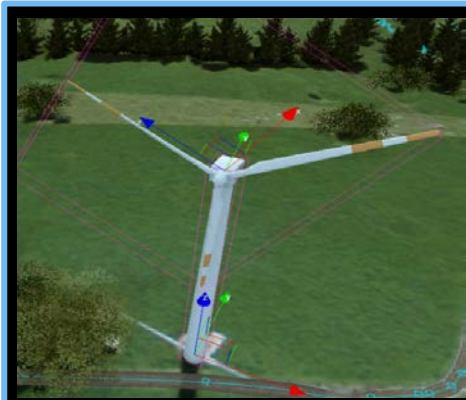
Digital Elevation Model (DEM)



Orthophoto



Overview



3D model of a wind turbine



Terrain textures and 3D vegetation objects



Close view

Adding 3D objects to the base model

...for participative planning: Land improvement



...for participative planning: Land improvement



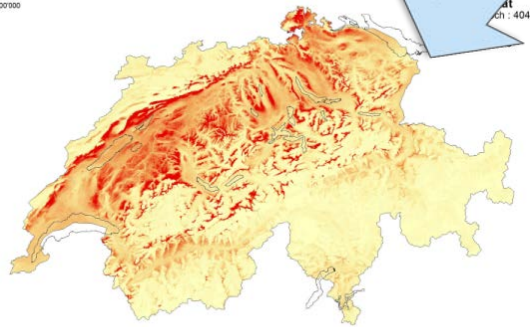
...for participative planning: Land improvement



...for participative planning: Land improvement



Interactive decision making...



0 5 10 20 30 40
Kilometer

Ecosystem Services:
Optimal Location



Workshops



3D-Visualization

... for an iterative learning process

Take home messages

- Mapping ecosystem services generates *cross-sectoral* policy relevant information
- Reliable and high-quality information on ecosystem services is key for supporting *local* decision-making processes
- -

PLUS

PLANNING OF
LANDSCAPE AND
URBAN SYSTEMS