Potential of Forest Monitoring Data for policy consulting and practice support

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Introduction

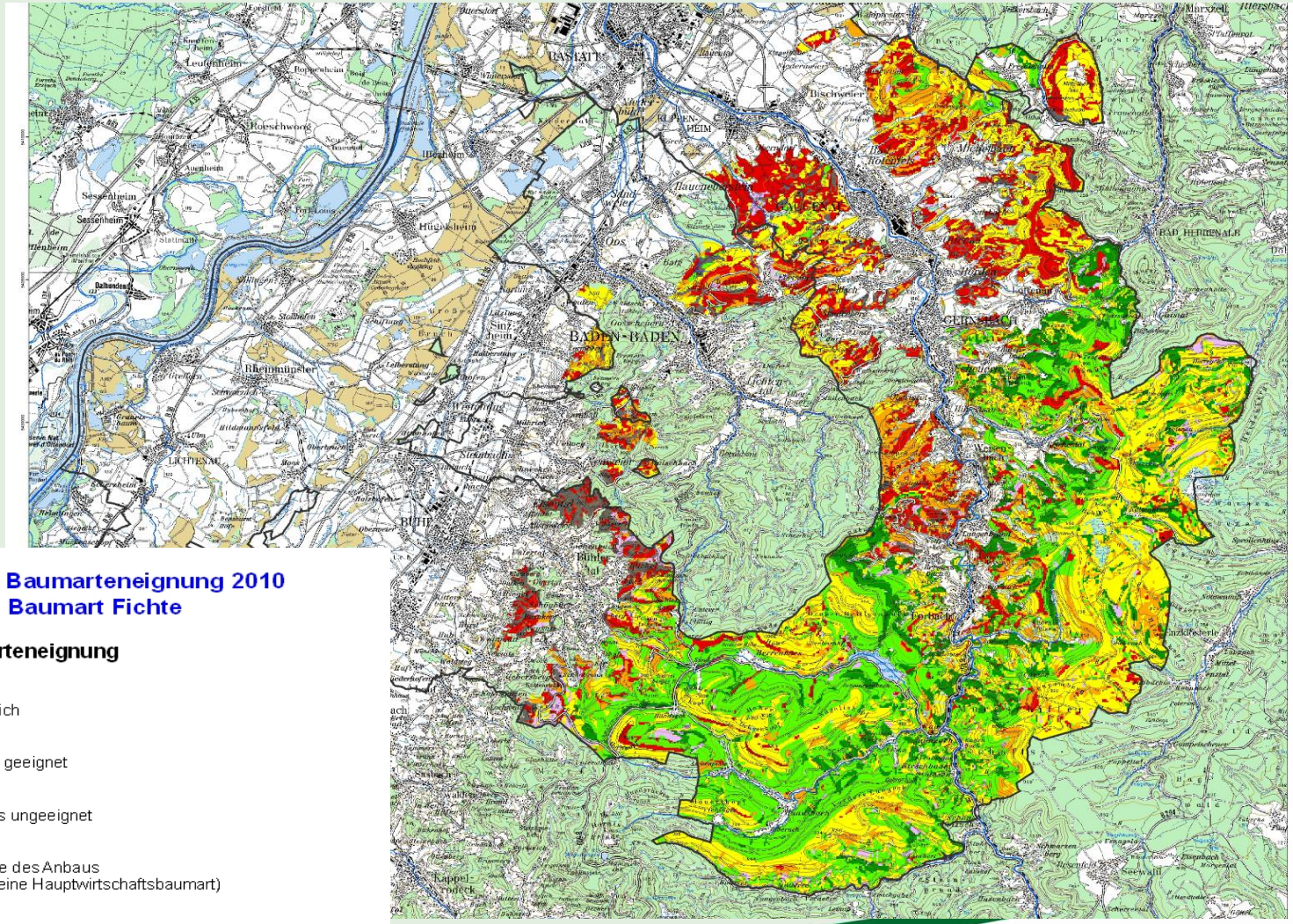
Initial Theses

1) Forest Environmental Monitoring (FEM) developed in the context of **Forest Decline and Air Pollution**. But a large number of FEM data are not bound to that context rather can be combined to answer **actual problems** like Climate Change
2) This flexibility and adaptation to actual problems has been substantially enhanced under the actual FutMon project
3) Linking NFI to FEM is necessary for quantifying the influence of chemical, physical and meteoro-logical changes in site conditions on productivity and functions of forests

Adaptation of Forest to Climate Change

Shift in species areal (1).

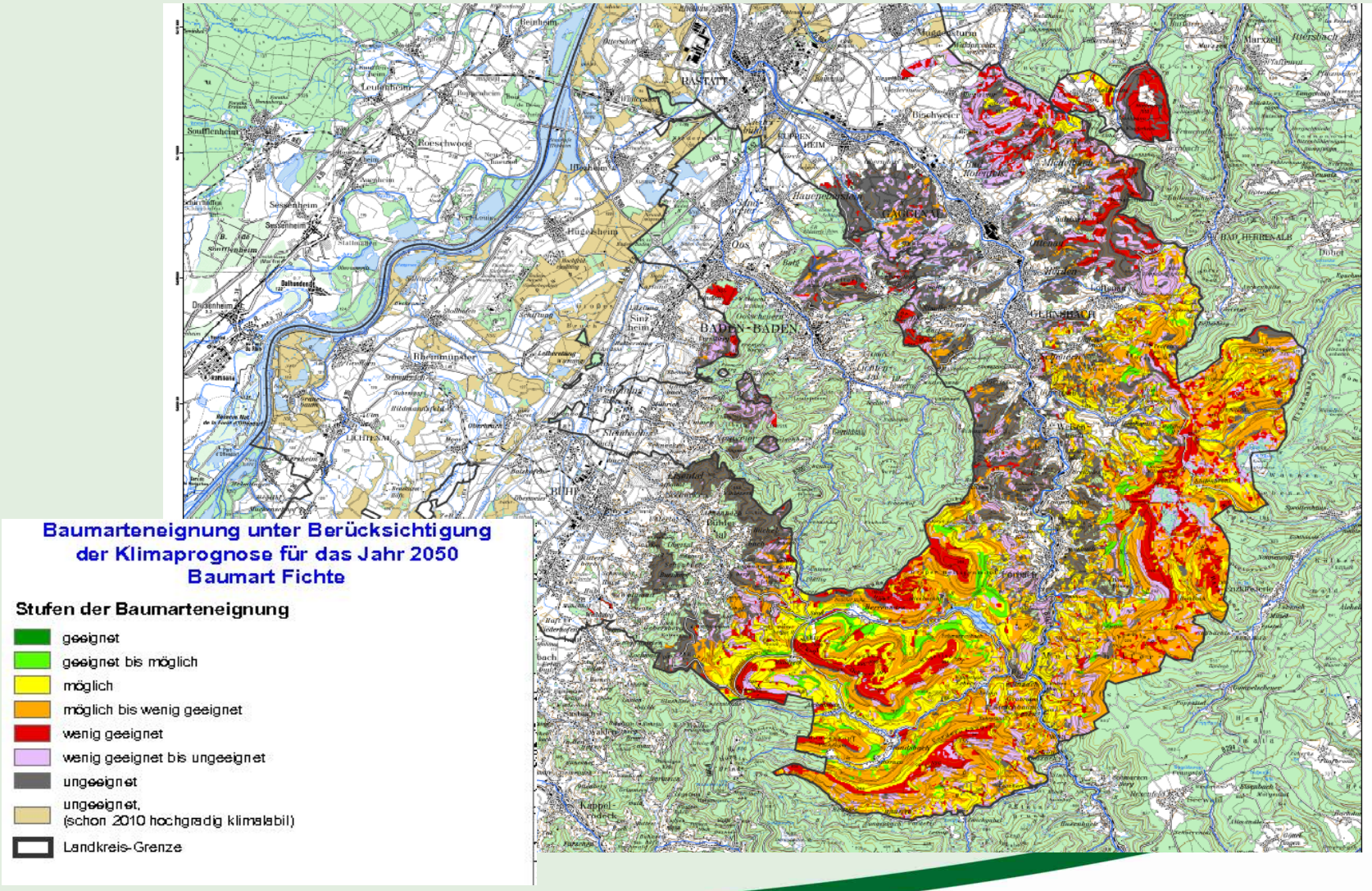
Suitability of site conditions for spruce 2010, based on EU wide Level I data, Rastatt/Baden-Baden, SW Germany



Adaptation of Forest to Climate Change

Shift in species areal (2).

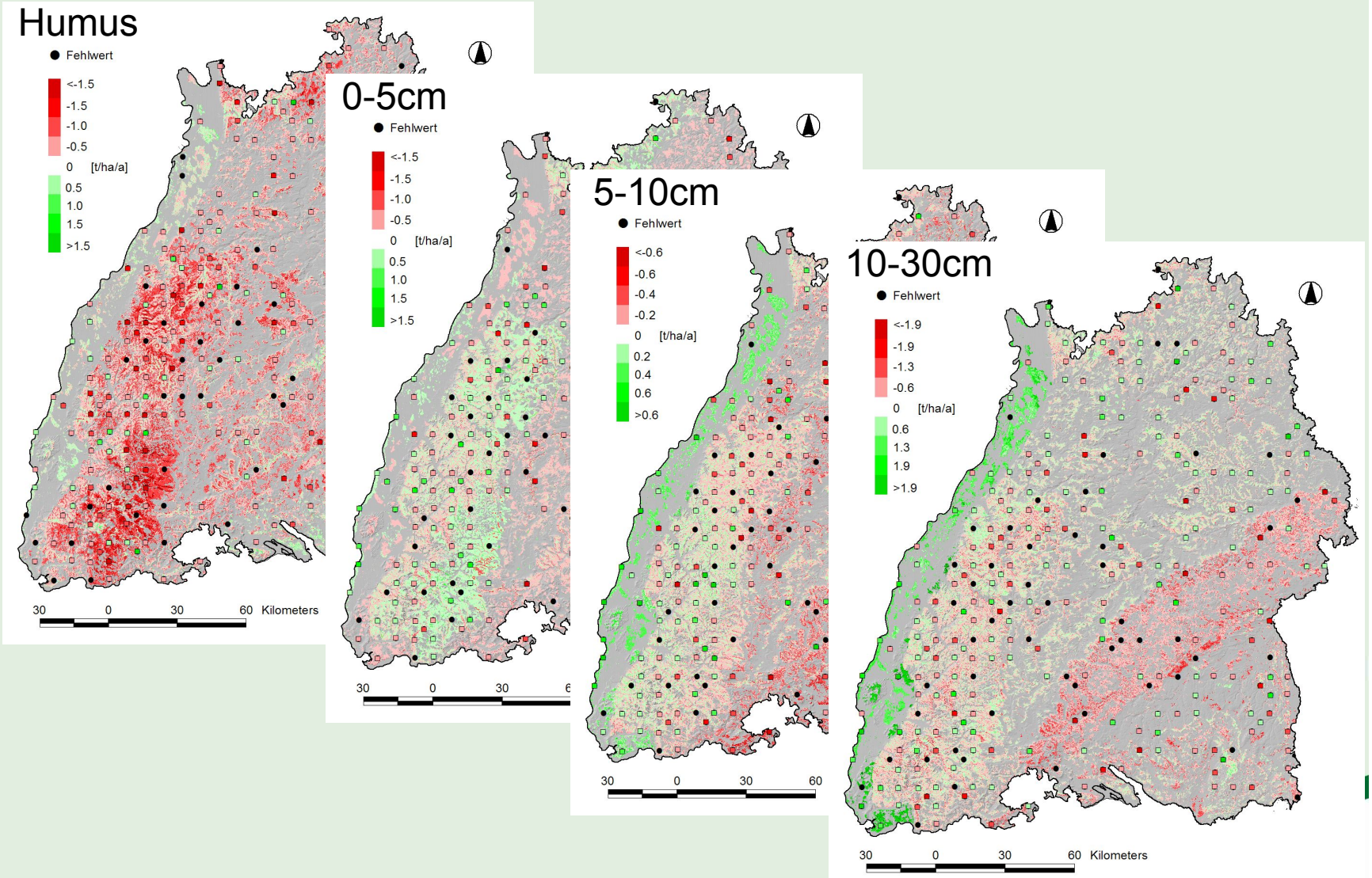
Suitability of site conditions for spruce 2050 (IPCC B2), based on EU wide Level I data, Rastatt/Baden-Baden, SW Germany



C - Sequestration in Forest Soils

Regional development of Carbon stock in different soil depths (1)

based on Level I data (soil inventories 1992 / 2007)



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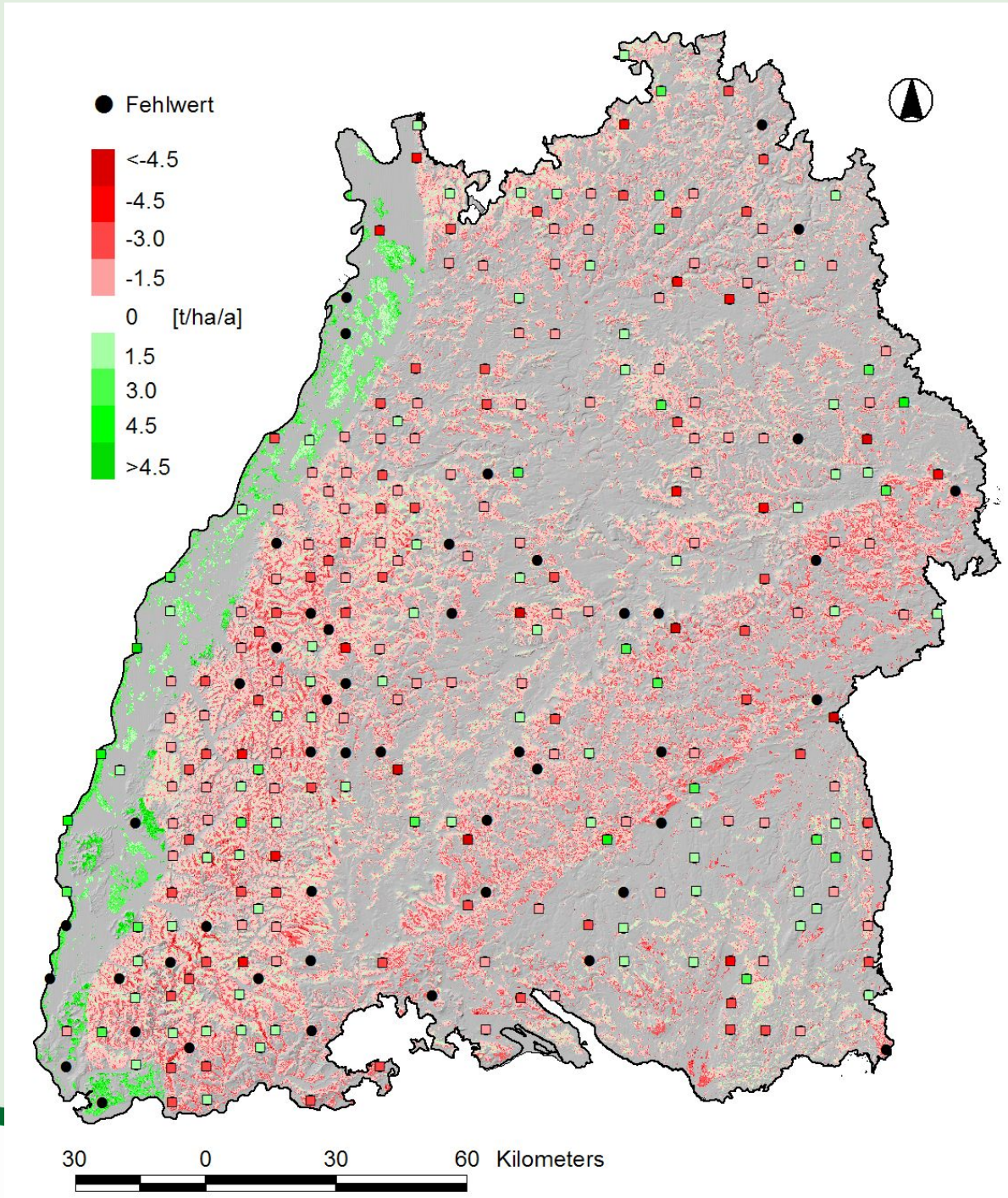

C-Diff. Forest Floor + Min. Soil. up to 30cm (2)

based on Level I data (soil inventories 1992 / 2007)

Statistics (t/ha/a)

Mean: -0.699

StD: 1.085

Minimum: -7.710

Maximum : 6.039

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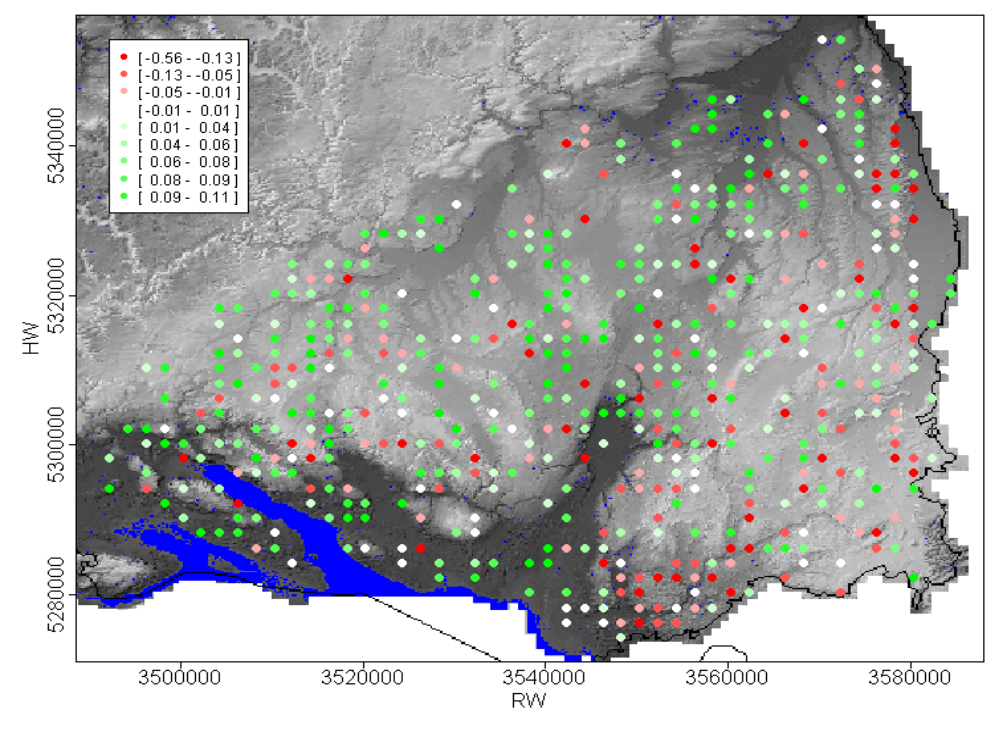
Sustainable Forest Productivity

Sustainable nutrient cycles and increased felling

Oberschwaben, southern Germany, based on Level I, Level II and NFI data

Demand of nutrient (Ca) recirculation



green: element budget positive
red: element budget negative, element export with timber harvest has to be compensated by wood ash re-cycling

Result:
In a test region (Oberschwaben 140. 000 ha) up to 350.000 t/a fuel wood can be harvested sustainably in addition to the annual timber harvest. This corresponds to the biomass demand of a 200 MW power plant (Gundremmingen = 260 MW)

Conclusion and Outlook

- FEM data provide a strong potential for adequately supporting the demands of **policy consulting** and **practice support** in the fields of e.g. **Climate Change**, **Sustainability** of Forest Production, **Water Preservation** in Forests, **Soil Protection** by Forests and **Protection of Bio-Diversity** by Forests.
- **Decision support tools** can be derived from FEM data and a combination with NFI data. The additional data demand is minimal.
- **Methods harmonization** and **Quality Assurance** features are very highly developed in FEM (through FutMon and the work of ICP Forests). This enables to generalize decision support tools to a large extent.
- FEM data can be directly introduced into most important environmental **reporting systems at EU level** and will be a substantial part of them.

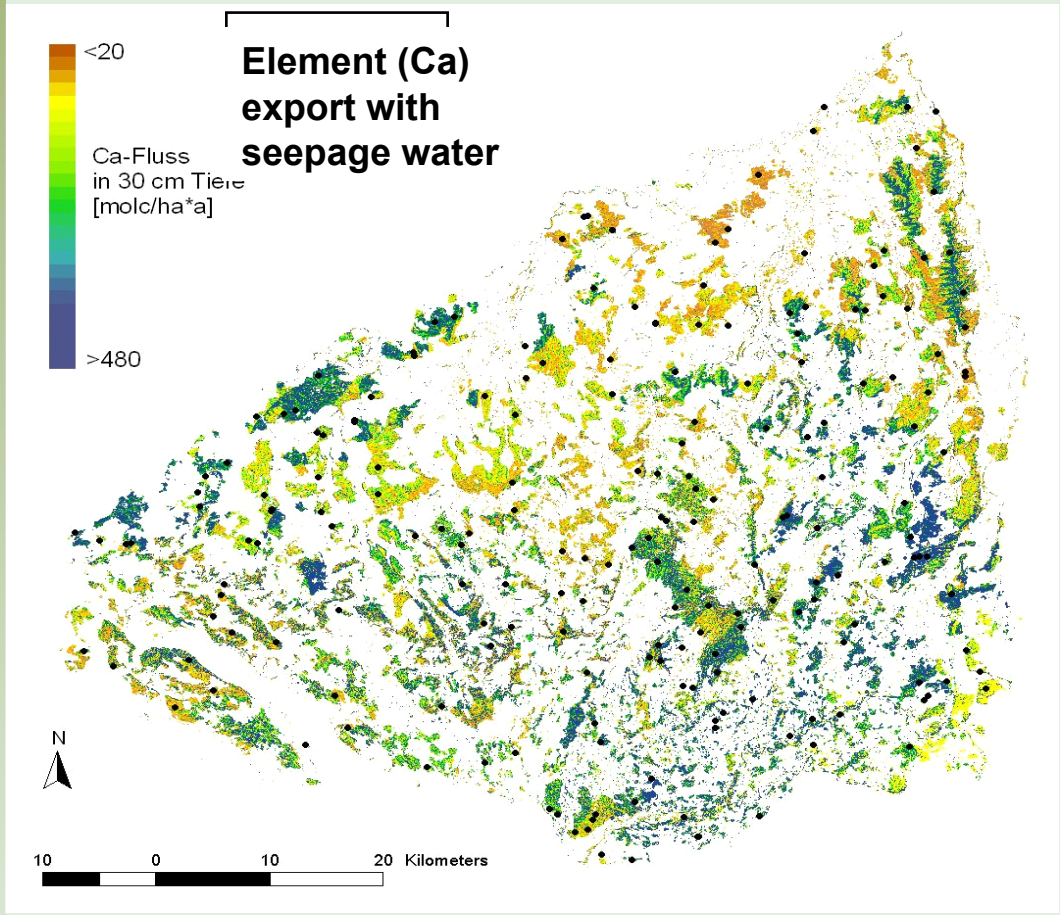

Thank you
for your
kind
attention

Sustainable Forest Productivity

Sustainable nutrient cycles and increased felling (1)

Oberschwaben, southern Germany, based on Level I, Level II and NFI data

Step 1: nutrient data from forest monitoring



Step 2: Combination of nutrient data with biomass information from national forest inventory (Bundeswaldinventur)

Conclusion (1): Potential contribution of FEM and NFI to policy consultation and decision support tools

Information need at EU level	Level I (16x16 km) spatial patterns of environmental status variables						Level II (302 fully equipped case studies in Europe) Process studies, contiuous time series of environmental status variables							NFI	Action groups of EnForMon under LIFE plus
	Head data	Crown cond.	Soil	Nutrient sup.	Vegetation	NFI clone	Meteorology	Soil solution	Soil water	Nutrient sup.	Crown cond.	Growth	Vegetation		
climate change															**1) Climate change**, mitigation and adaptation **3) Forest health**, vulnerability and disturbances
Adaption of tree species	X						X		X						
Risc management		X		X			X	X	X	X	X	X			
Carbon sequestration			X (soil)			X		(X)						X (above ground)	
Sustainable forest productivity															**2) Forest sustainability and productivity**
Material timber		(X)	(X)	X		X				X	(X)	X		X	
Fuel wood		(X)	(X)	X		X				X	(X)	X		X	
Water preservation (EU water framew. directive)															
Ecology															
Chemistry			X				X	X	X						
Amount			X				X		X						
Soil protection (EU soil thematic strategy)															
Soil acidification			X					X	X						
N eutrophication			X					X	X						
Hevy metals			X					X	X						
soil erosion	X		X				X								
Biodiversity (EU biodiversity strategy)															
Plant sociology					X								X		
Tree species	X					X								X	
Habitate dead wood						X								X	