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Institut für angewandte Ökologie
Institute for Applied Ecology

Potential for restoring carbon stocks in temperate managed forests – need for independent data

Protecting and Restoring the Global Forest Carbon Stock

Greenpeace/RFN Side event at SB46

Hannes Böttcher, et al.

Bonn, May 17 2017



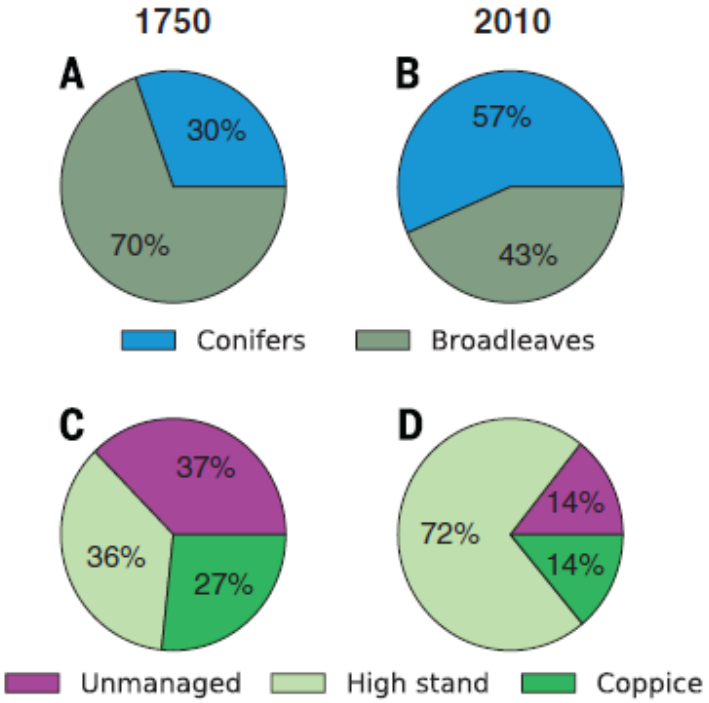

Key hypotheses

- Forest restoration needs forest information
- Independent data (independent from mandated data) is key for assessing restoration potentials
- Independent forest data becomes more and more available
- Capacity building, tools and guidance is needed for transparent use and interpretation

History of forest carbon loss and restoration in Europe

Changes between 1750 and 2010

Forest area	
1750	2010
193 Mha	213 Mha



Increased carbon stocks

- Forest area increased (2.6 Gt CO_2)
- More fast growing conifers than broadleaves (increased growth, 2.2 Gt CO_2)

Decreased carbon stocks

- Land use change (forest loss, 11.4 Gt CO_2)
- Forest management intensity increased (unmanaged forest taken under production, 7 Gt CO_2)

Naudts et al. 2016

Potential for forest restoration in Germany

Historic development

BMEL 2016; www.bwi.info

Potential for forest restoration in Germany

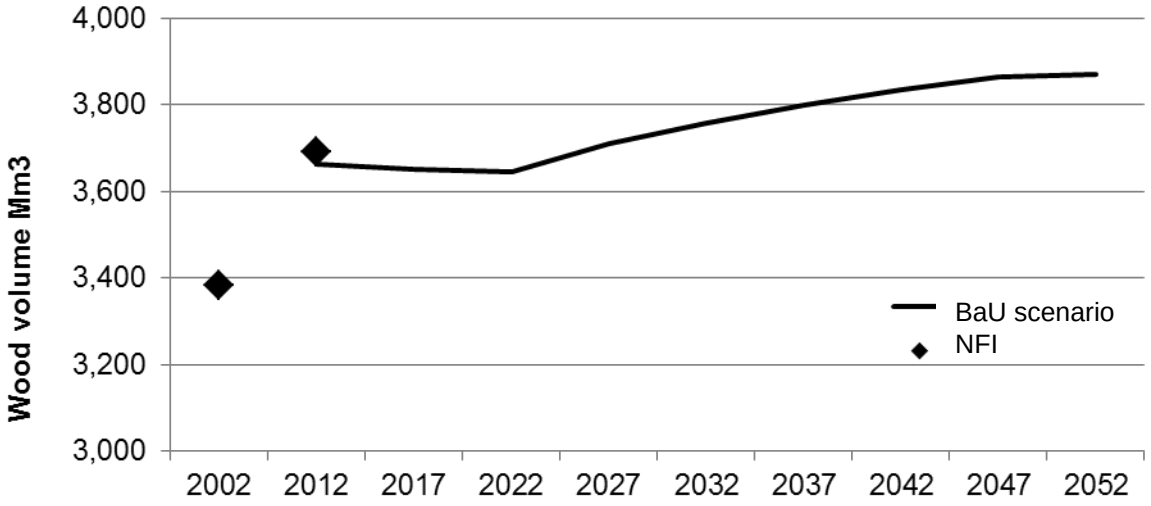
Historic development

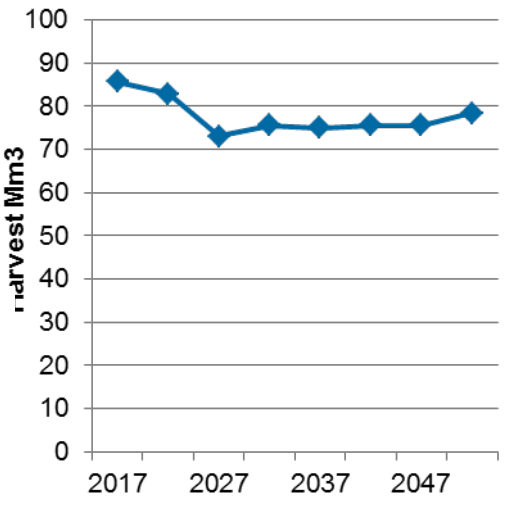
Mt CO_2	Today (2014)
Forest sink	58
Wood product pool	3
Substitution (material)	30
Substitution (energetic)	36
Total	127

BMEL 2016; www.bwi.info

Potential for forest restoration in Germany

National projection



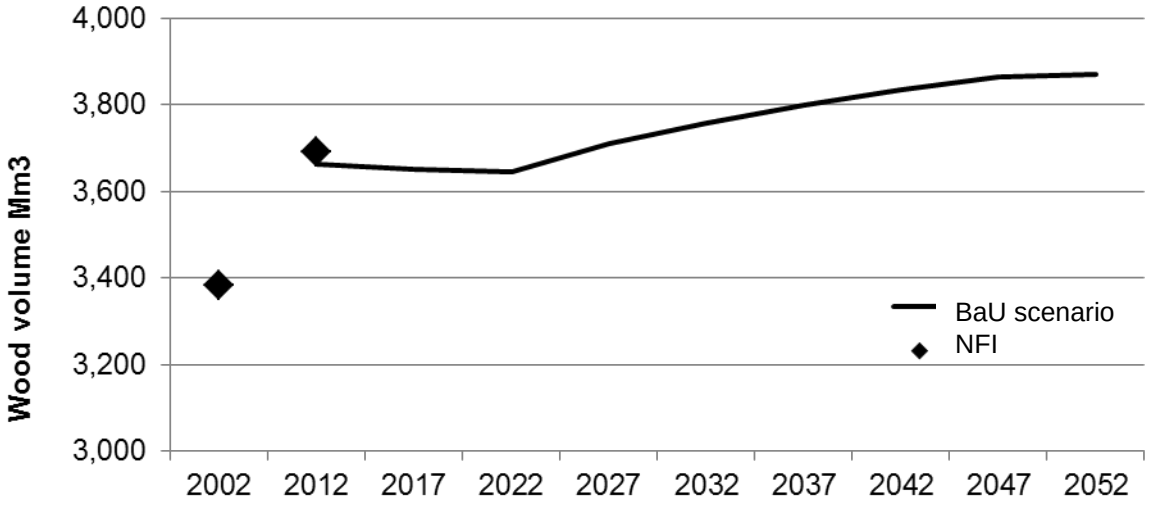


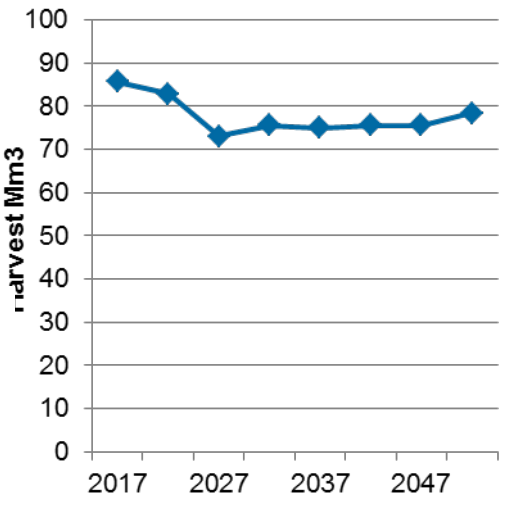
Mt CO_2	Today (2014)	2050
Forest sink	58	11
Wood product pool	3	lower
Substitution (material)	30	lower
Substitution (energetic)	36	much lower
Total	127	?

www.bwi.info; BMEL, 2016

Potential for forest restoration in Germany

National projection





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www.bwi.info; BMEL, 2016

Available data for assessing forest restoration potentials in Germany

- Germany provides detailed records of the National Forest Inventory (tree species, tree volume, etc.)
- Data can be used for assessing status quo and theoretical potentials
- National projections provide scenarios forest standing volume
- However,:
  - National Forest Inventory data collected primarily for forest resource assessment and planning
  - Information on soils is lacking
  - Information on deadwood carbon pools lacking
  - Projections rely on official models and assumptions that cannot be changed easily

Project “Waldvision 2050”

Aim and methodology

Aim: Assess the restoration potential of Germany’s forests in detailed alternative silvicultural scenarios

Funded by Greenpeace

Methodology

- Use of publically available NFI data from inventory in 2002 and 2012 (more than 40,000 plots)
- Build a model on forest growth and mortality by comparing individual tree data of the two inventories
- Construct a baseline and alternative scenarios with varying degree of management intensity (target diameters, thinning intervals, species composition etc.) and share of protected areas
- Analyze impact on environmental indicators (GHG balance, dead wood, stand structure, etc.)

Project “Waldvision 2050”

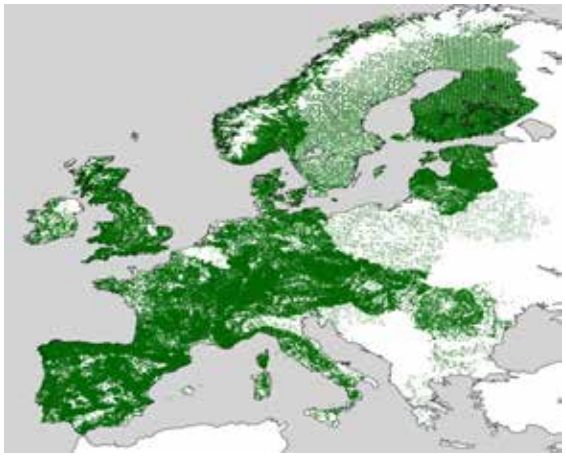
Expected results

- Alternative scenario results will describe the range of possible futures of forest ecosystem services for guiding forest policy
  - Illustration of trade-offs between different objectives
  - Spatially explicit differentiation of potential restoration (stand type, silvicultural stage)
- Scenarios will put emphasis on multiple objectives
  - Carbon sequestration, biodiversity and other ES services
  - Silvicultural treatment reflects potential natural vegetation
  - Implementation of nature conservation targets
  - Focus on production of long-lived wood products
- Harvest will describe wood removals available under constraints (not demand driven)

Increasing availability of data on European forests

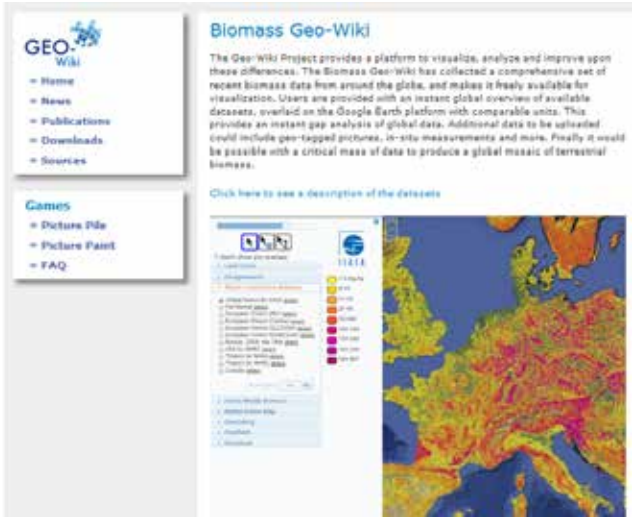
Public data bases

Mauri et al. 2017



- NFI data become available (e.g. EU Forest database hosted by the Joint Research Centre (JRC))
- Lacking information on tree volume, ownership, carrying capacities

- Biomass maps are available for assessing status-quo
- Calibration with field data and combination of maps improves accuracy (e.g. Biomass geo-wiki portal)
- New satellite data become available (e.g. EU Copernicus)



http://www.geo-wiki.org/branches/biomass/

Open tools increase data accessibility and capacities

Example 1

- Guidance needed on how to combine global datasets, e.g. Global Forest Watch, to improve national estimates of deforestation and degradation
- Results in increased usability of data for different stakeholders (e.g. assessing zero-deforestation supply chains)
- Example: Online Atlas distinguishes deforestation linked to land concessions of specific companies www.cifor.org/map/atlas

Gaveau et al. 2016

Open tools increase data accessibility and capacities

Example 2

- Data might be physically accessible but cannot be used due to limited capacities in e.g. data processing or interpretation for national purposes
- Opportunities in combining more effectively field data and satellite information
- Example: FAO OpenForis is a set of free and open-source software tools that facilitates national level data collection, analysis and reporting

Forest monitoring capacities are constantly increasing

2005-2010

2010-2015

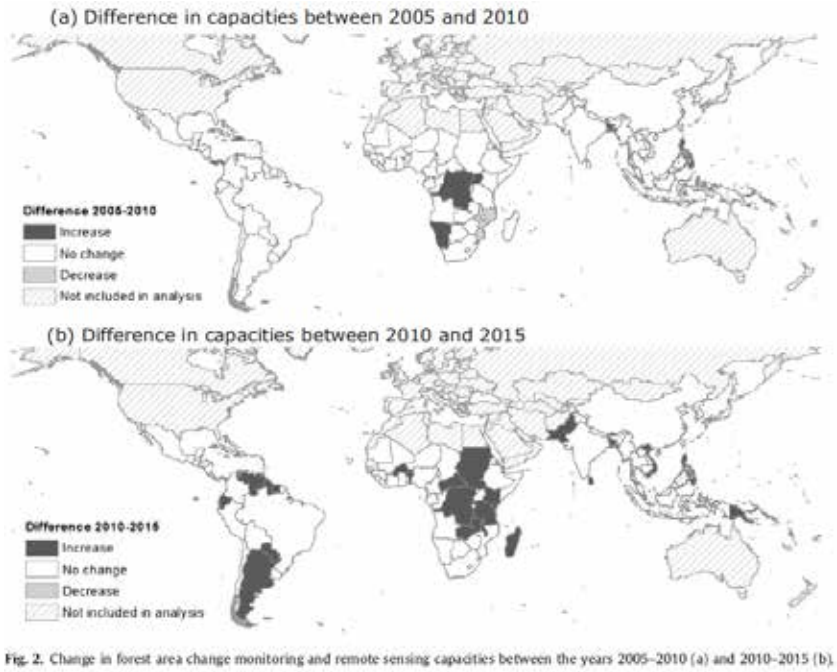


Fig. 2. Change in forest area change monitoring and remote sensing capacities between the years 2005–2010 (a) and 2010–2015 (b).

Forest area change monitoring and remote sensing capacities

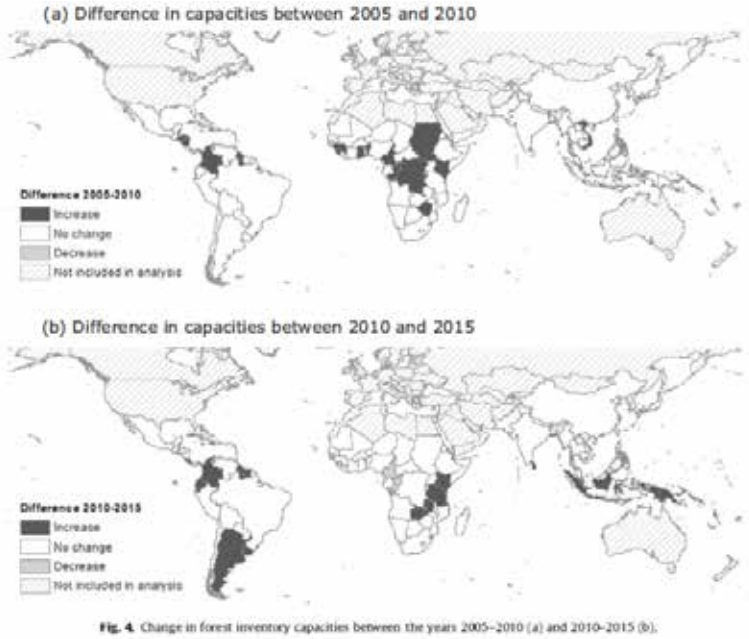


Fig. 4. Change in forest inventory capacities between the years 2005–2010 (a) and 2010–2015 (b).

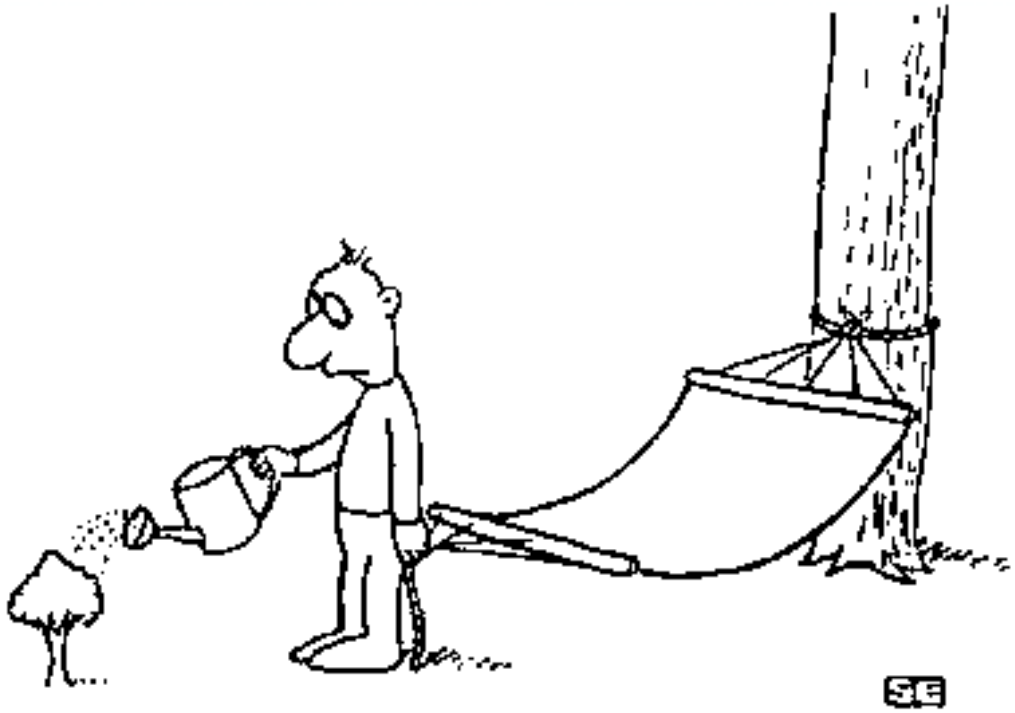
Forest inventory capacities

Romijn et al., 2015

Key messages

- Forest restoration needs forest information
- Independent data (independent from mandated data) is key for assessing restoration potentials
- Independent forest data becomes more and more available but important data gaps exist
- In addition to public access to key data sources, capacity building, tools and guidance is needed for transparent use and interpretation

Thank you!



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Slides 3-10: Project funded by Greenpeace “Waldvision 2050”

Slides 11-14: Project procured by European Commission Project: Strengthening Independent Monitoring of GHG Emissions from Land Activities for Publishing, Comparing and Reconciling Estimates: Contract number: No. 340202/2014/692569/ETU/CLIMA.A.2

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- OpenForis portal www.openforis.org/
- Biomass geo-wiki portal http://www.geo-wiki.org/branches/biomass/