Impacts of forest management on European forests' C balance

Gert-Jan Nabuurs,
MartJan Schelhaas, Bas Lerink, Louis König

VERIFY, Reading meeting,
March 2019

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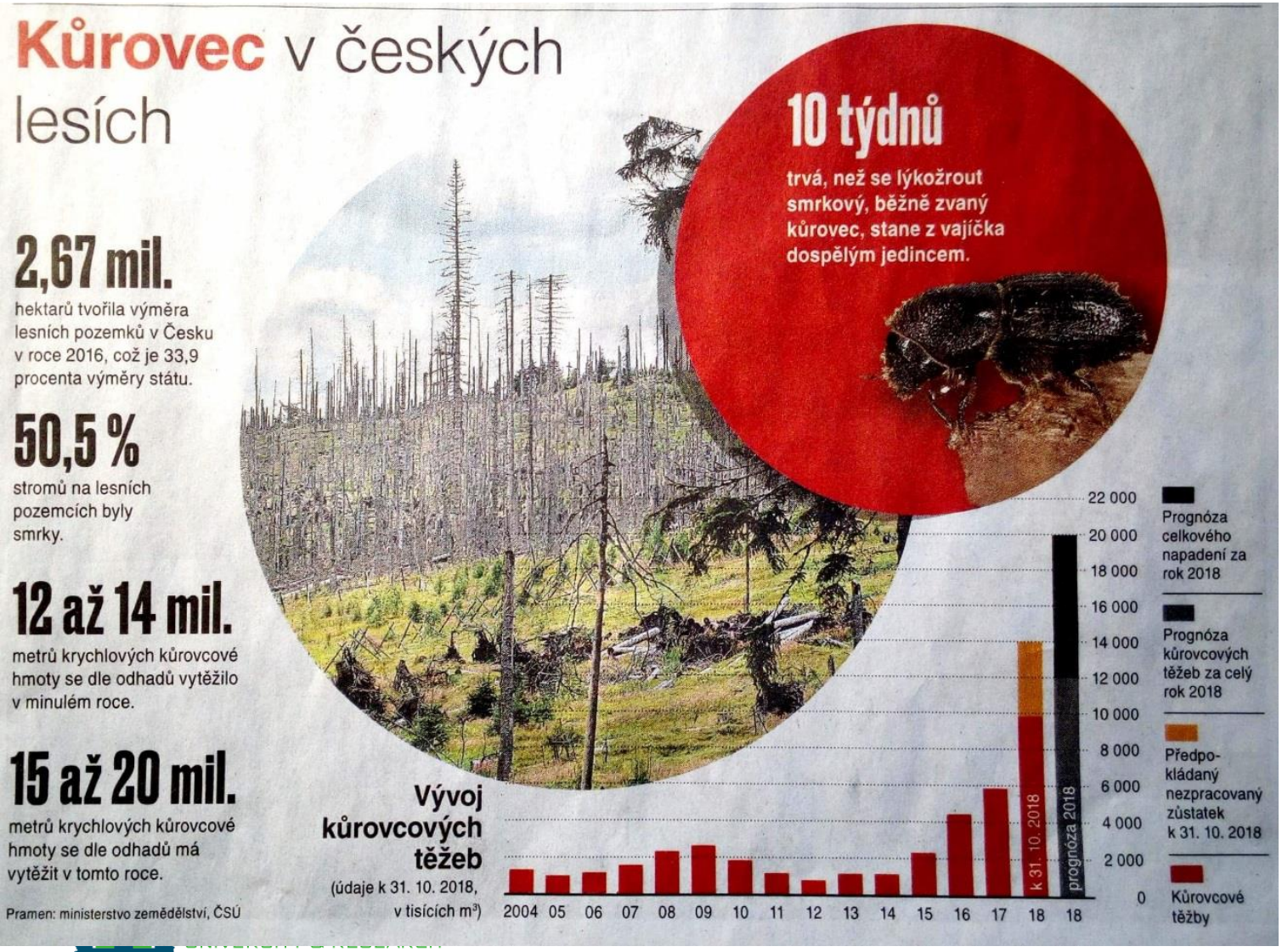
VERIFY

Actuality: bark beetle in C Europe.



In 2018 in Cze: 20 Mm3 damage.
This year 30-40 Mm3 damage.

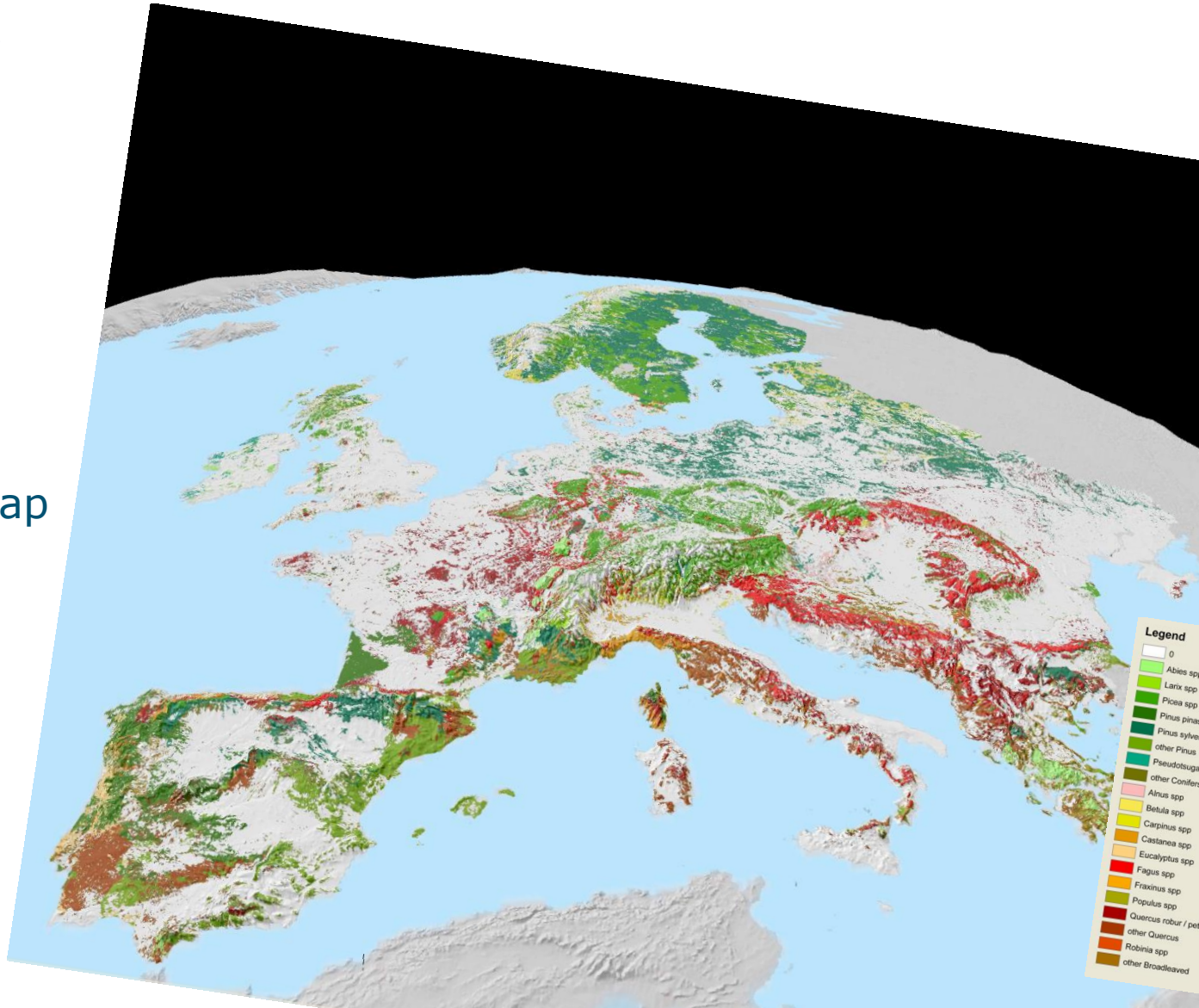
Same messages from Swi, Aut, Slr, Pol !

Forest owner decisions what to plant will determine C balance

Practically all European forests are managed and accessible. *This would imply we can strengthen the mitigation role*

1x1 km, tree spp map
(Hengeveld et al.2012;

Brus et al. 2012)



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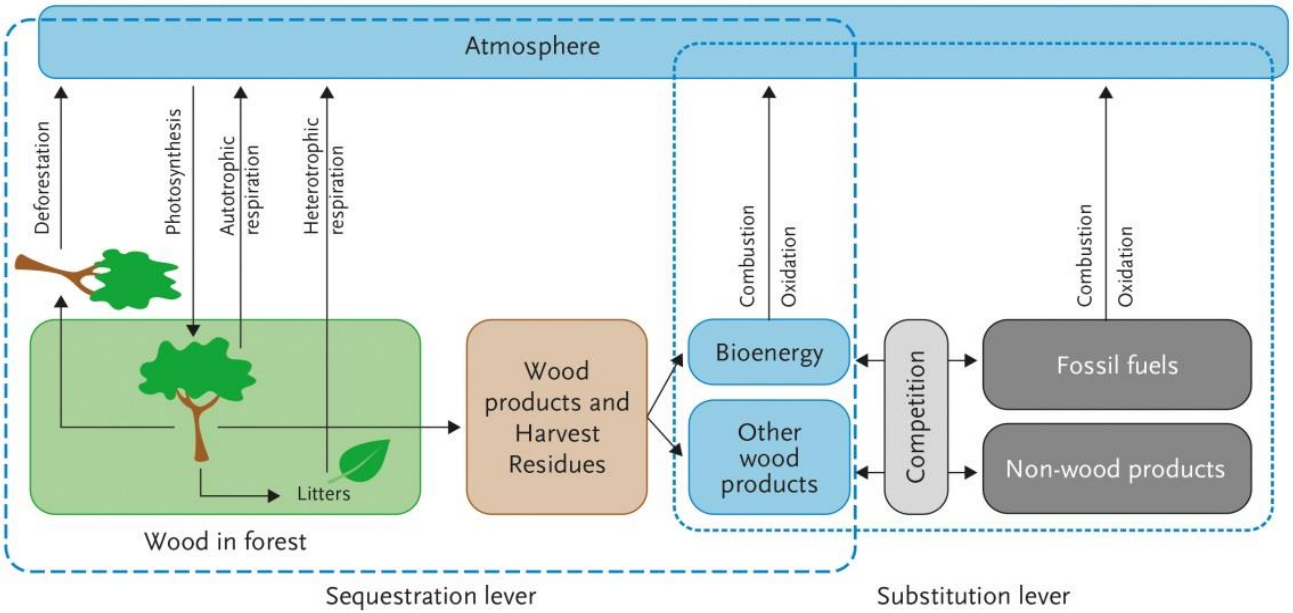
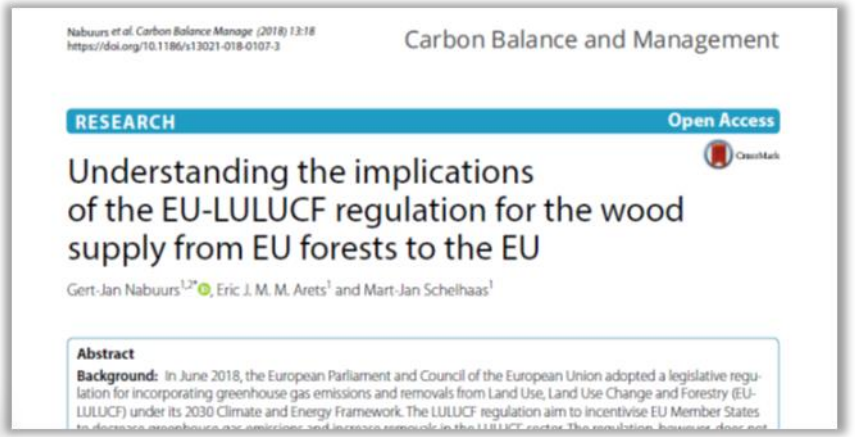
Present role of the European forest

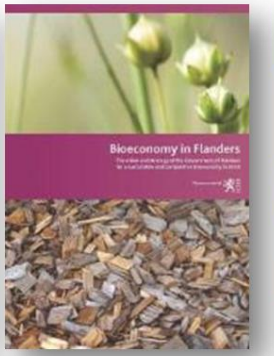
- Sink 450 Mt CO2, or **10%** of EU emissions (growth>harvest)
- Wood products sink of 44 Mt CO2 + substituting aluminium and plastics.
- Biomass for bioenergy provides 7% of total EU energy need

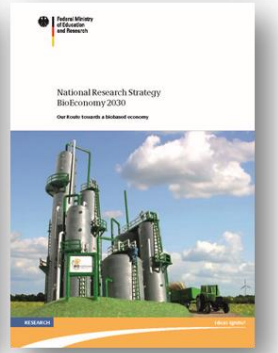


IPCC 2007

EU forest management is directly impacted by bio-economy strategies & other policies

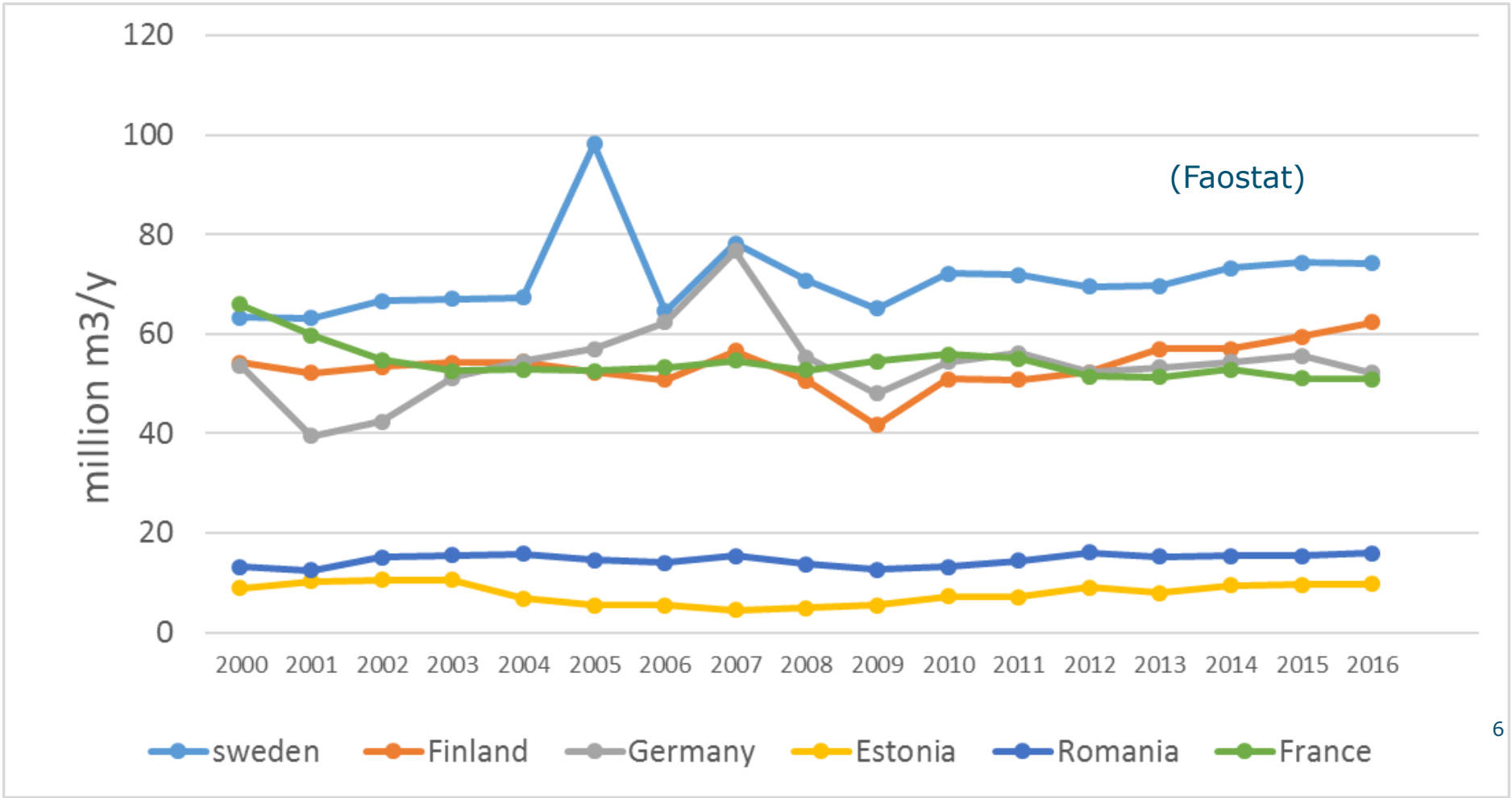




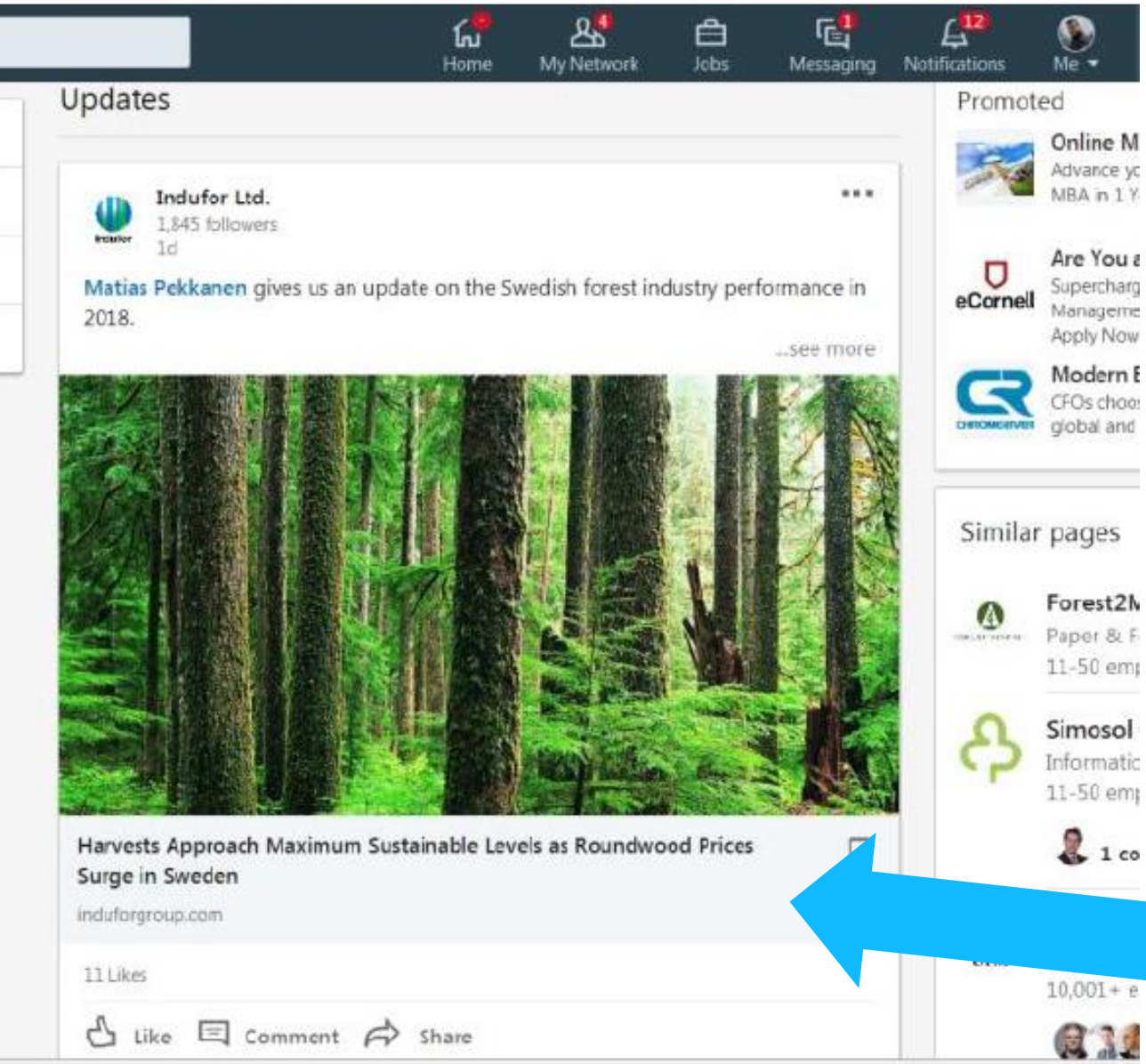


Has harvesting gone up?

Harvesting levels are quite uncertain



..but there are also other signals

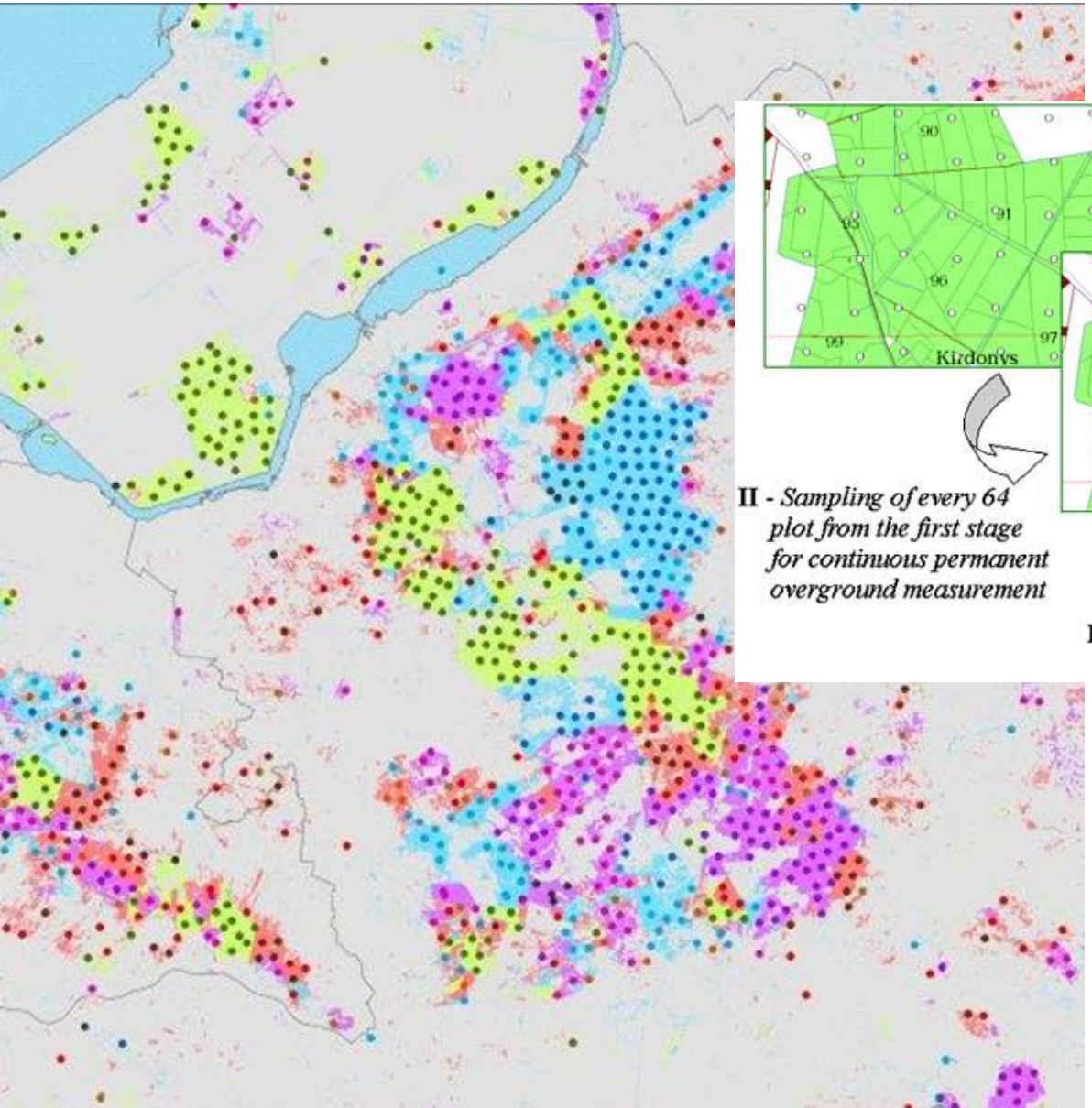


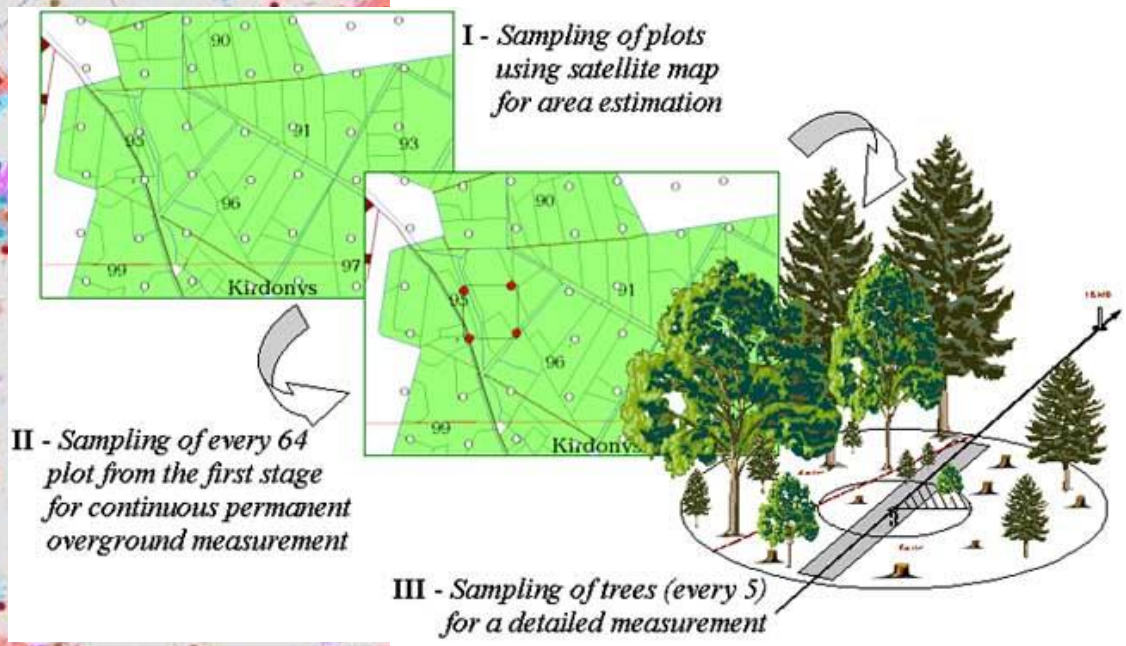
11 march 2019

How to tackle this in VERIFY

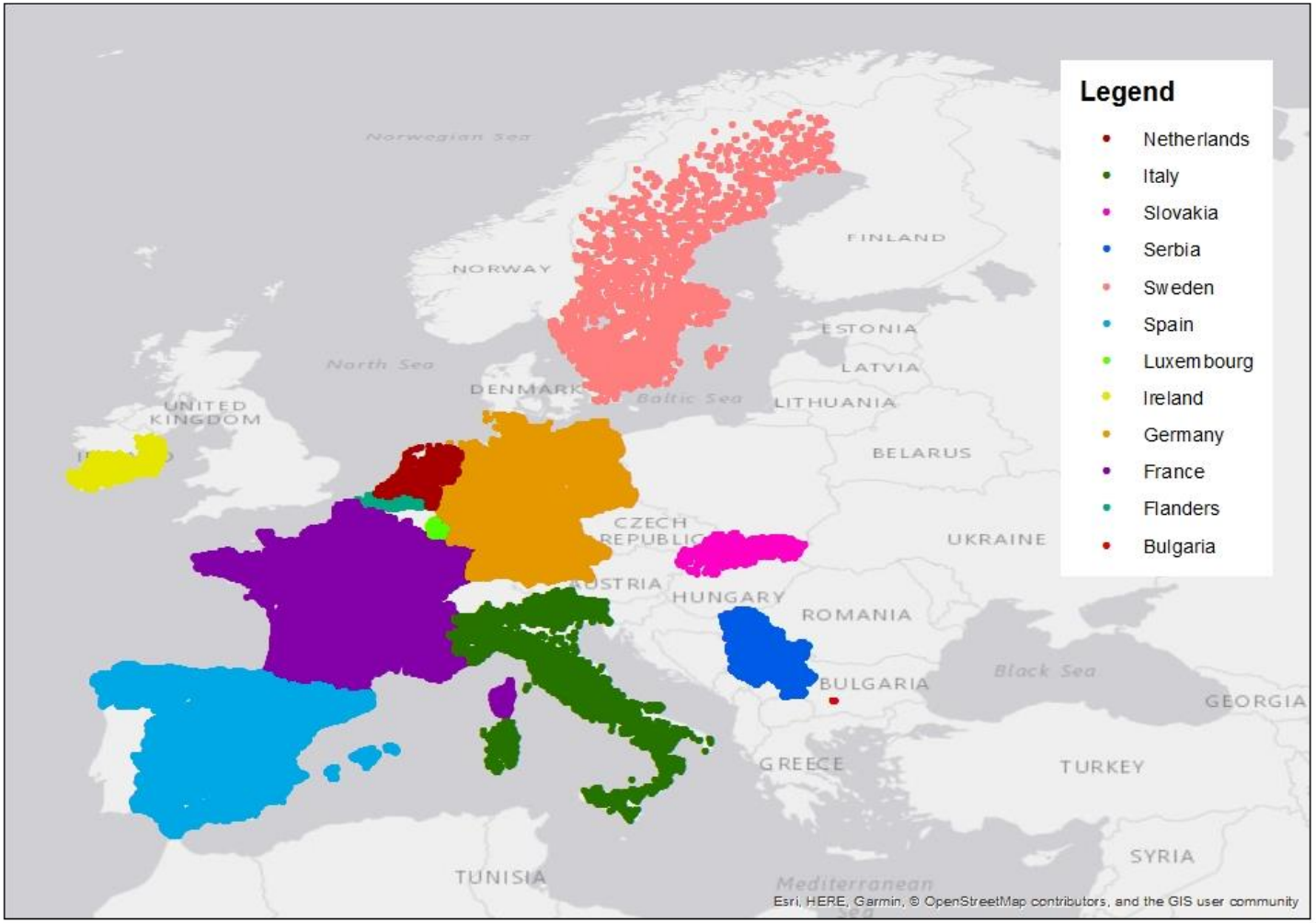
- Based on ground based forest inventory data:
  - Assess actual forest management
  - Bottom-up assess European forest and forest sector carbon balance
    - Comparable data as countries use to report to UNFCCC
    - but independent modelling & harmonised

Main data: all EU countries have a sample based inventory





VERIFY NFI plot coverage



- 200,000 plots.
- + Pol, Swi, Por, Nor

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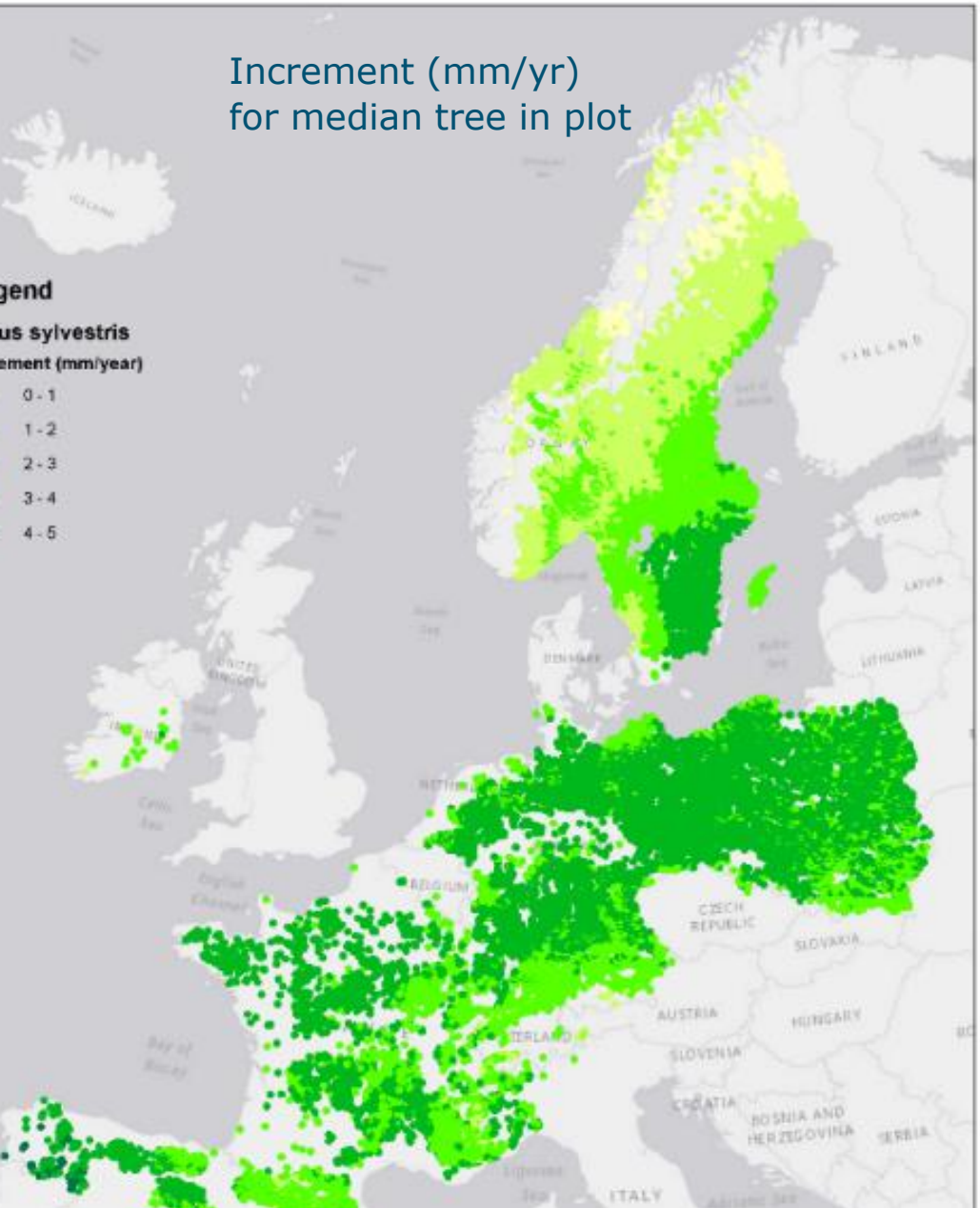
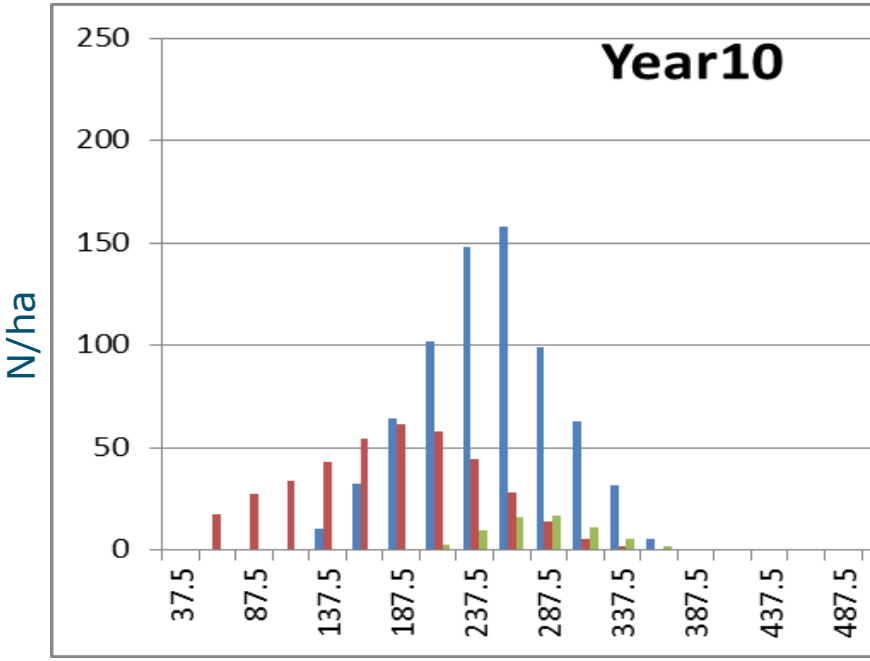
Every NFI point is run in EFISCEN-Space

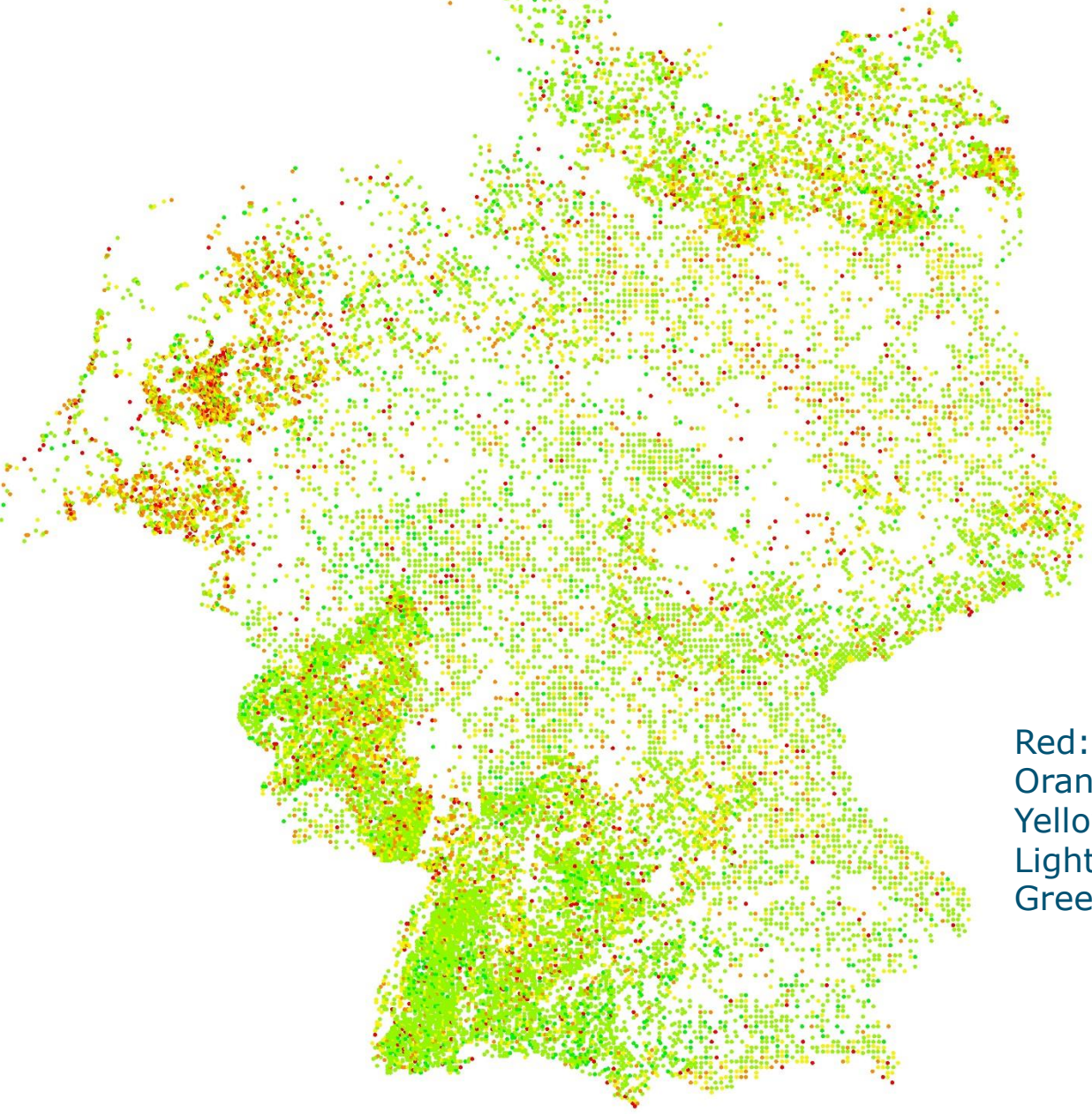


Empirical diameter class model. Climate sensitive, density dependent growth function (Schelhaas et al. 2018)



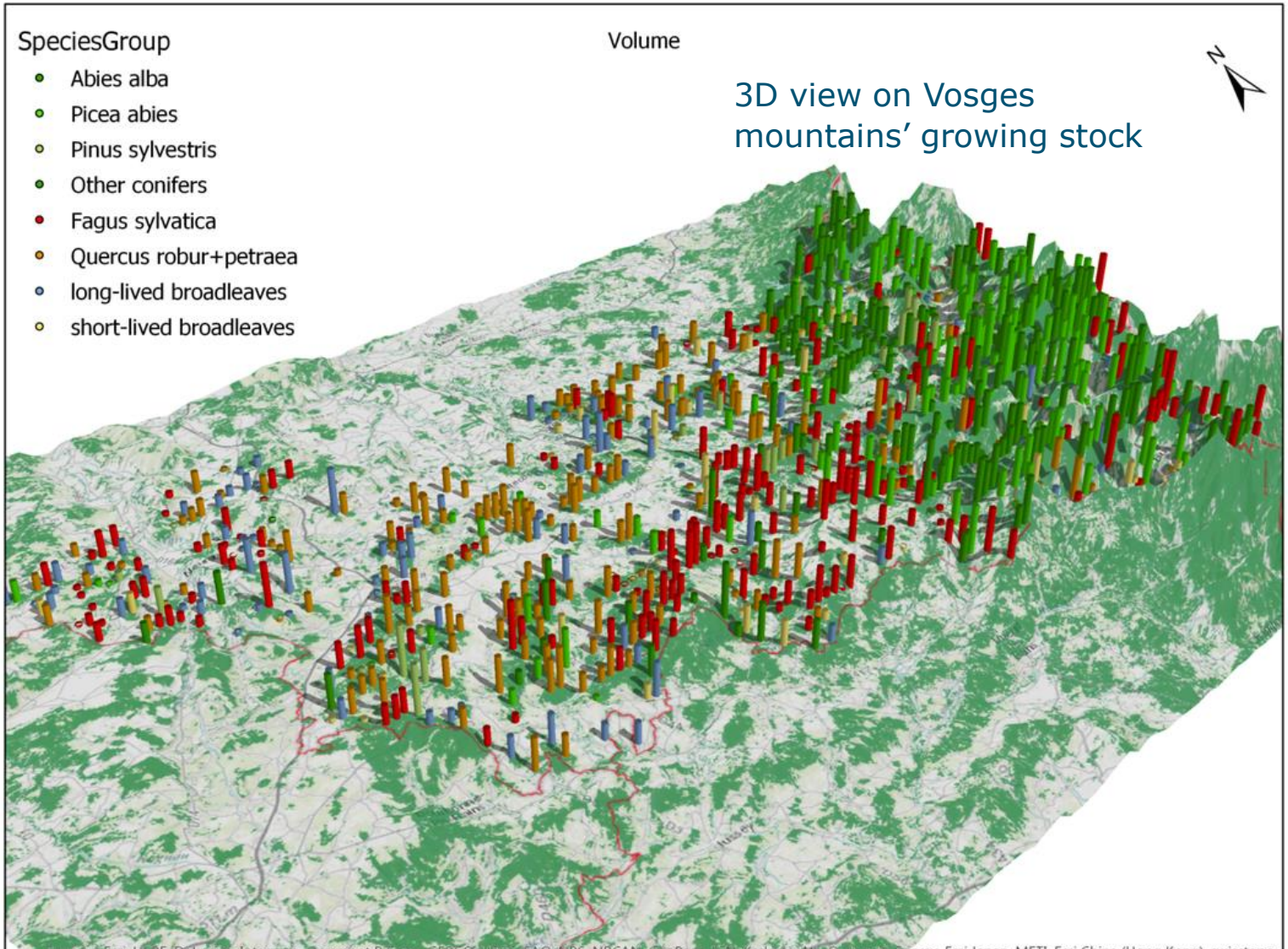
One plot

Stemwood volume increment simulated



Red: <5 m3/ha.y,
Orange: 7.5,
Yellow: 10,
Light green 20,
Green >20

Now able to make detailed resource projections on wood availability



Actual management is highly varying.

- from repeated NFIs we know the management is very different between owners and regions
- 16 million private owners, thousands public. Driven by wood market

PLOS ONE

RESEARCH ARTICLE

Actual European forest management by region, tree species and owner based on 714,000 re-measured trees in national forest inventories

Mart-Jan Schelhaas[1], Jonas Fridman[2], Geerten M. Hengeveld[3,4], Helena M. Henttonen[5], Aleksi Lehtonen[5], Uwe Kies[6], Nike Krajnc[7], Bas Lerink[8], Áine Ní Dhubháin[9], Heino Polley[10], Thomas A. M. Pugh[11,12], John J. Redmond[13], Brigitte Rohner[14], Cristian Temperli[14], Jordi Vayreda[15], Gert-Jan Nabuurs[1,8]*

1 Wageningen Environmental Research (WENR, previously Alterra), Wageningen University and Research, Wageningen, The Netherlands, 2 Swedish University of Agricultural Sciences (SLU), Umeå, Sweden, 3 Biometris, Wageningen University and Research, Wageningen, The Netherlands, 4 Forest and Nature Conservation Policy Group Wageningen University and Research, Wageningen, The Netherlands, 5 Natural Resources Institute Finland (Luke), Helsinki, Finland, 6 InnovaWood, Brussels, Belgium, 7 Slovenian Forestry Institute, Ljubljana, Slovenia, 8 Forest Ecology and Forest Management Group, Wageningen University and Research, Wageningen, The Netherlands, 9 Forestry Section, School of Agriculture and Food Science, University College Dublin, Belfield, Dublin, Ireland, 10 Thünen Institute of Forest Ecosystems, Eberswalde, Germany, 11 School of Geography, Earth & Environmental Sciences, University of Birmingham, Birmingham, United Kingdom, 12 Birmingham Institute of Forest Research, University of Birmingham, Birmingham, United Kingdom, 13 Department of Agriculture, Food and the Marine, Wexford, Ireland, 14 Resource Analysis, Swiss Federal Institute for Forest, Snow and Landscape Research (WSL)

Check for updates

OPEN ACCESS

Citation: Schelhaas M-J, Fridman J, Hengeveld

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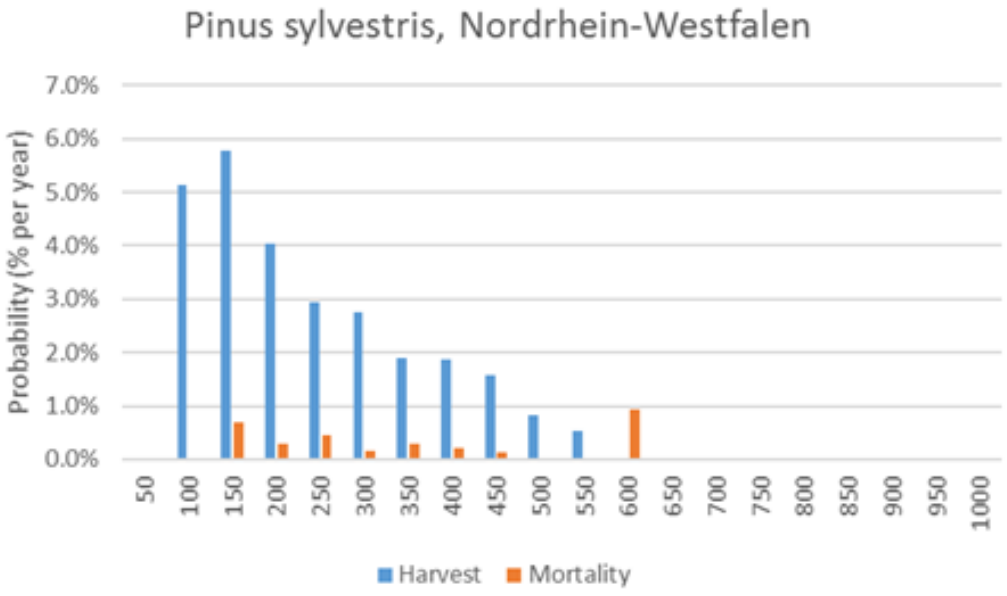
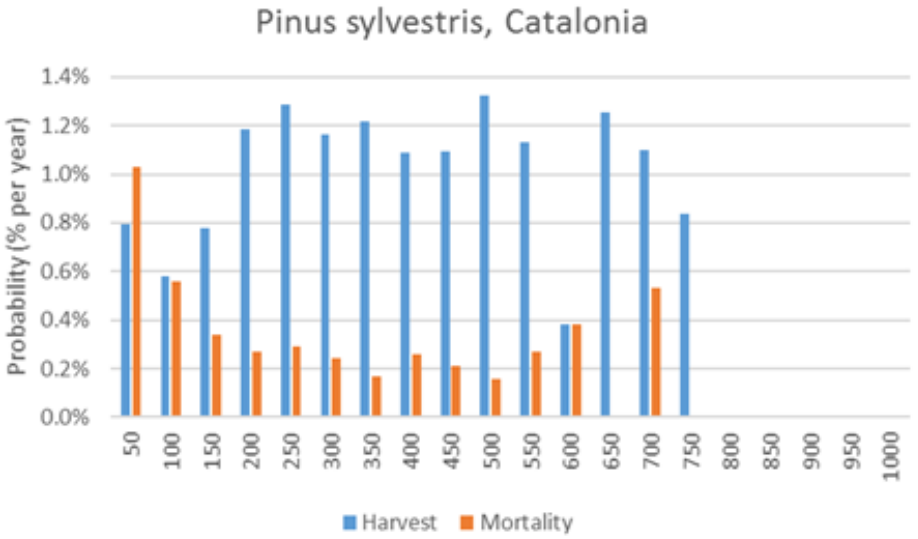
Understanding owner behaviour from repeated NFIs. Felling chance per diam cl.



Very low intensity and equal over all age classes in Catalonia



Schelhaas et al. 2018. PLOS One.

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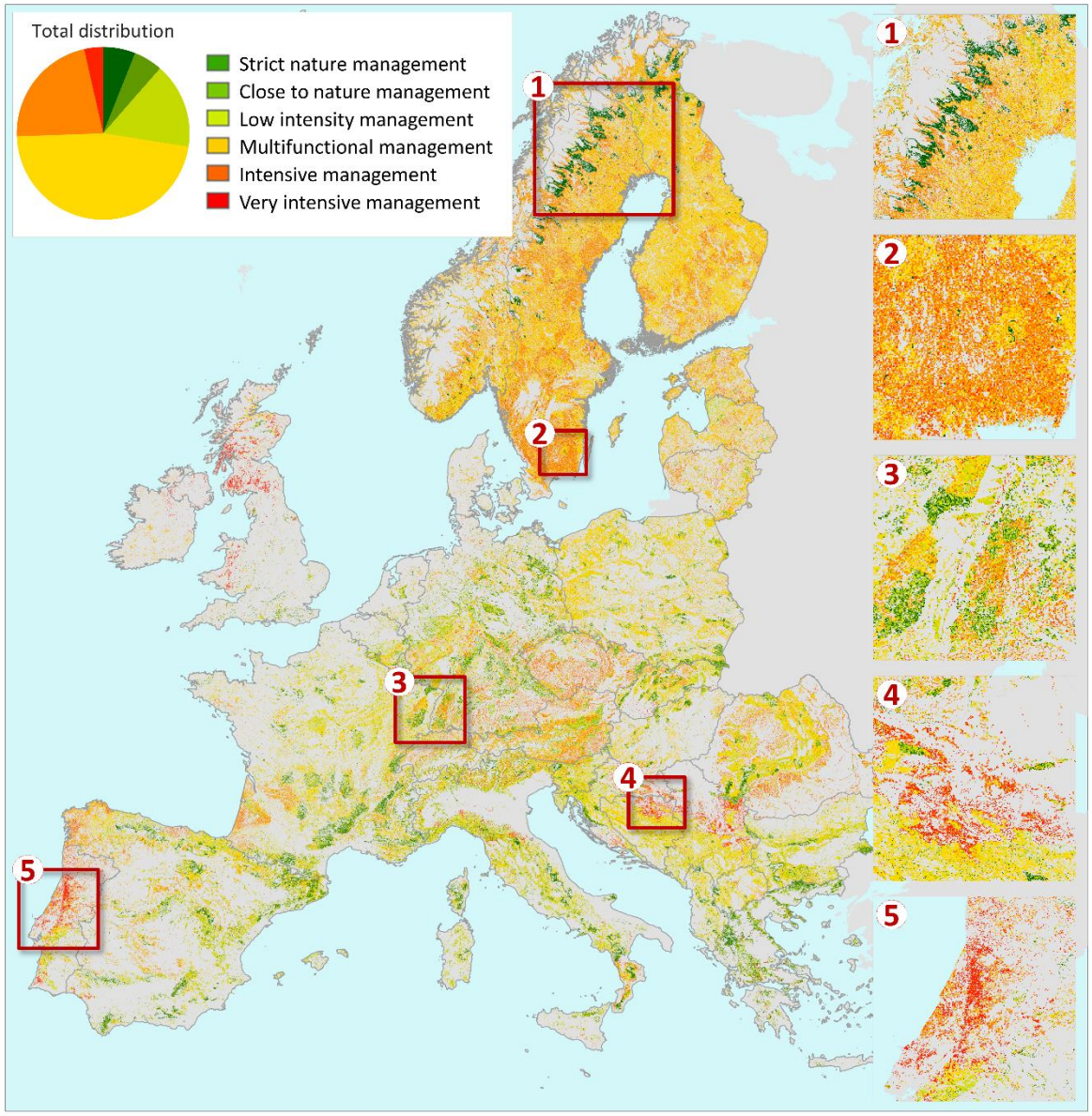
Management intensity map (draft)



Hendriks, Verweij, Perez-soba, Pulzl, Nabuurs, in review

Next

In European forests, management does have a very large influence. This role can be strengthened, locally specific measures

This year:

- Complete EFISCEN-space with soil module
- Provide bottom-up medium resolution carbon balance of European forests
- incorporate management trends and routines
- Serve as validation to ORCHIDEE

In meantime: Dutch Climate Accord

- Dutch Government is negotiating a Climate Accord. 300 million € in 2018 & 2019 for climate measures in all sectors.
- Out of this, 2 M€/y is allocated to forestry pilots in climate smart forestry. (WENR-WUR leads this for 38 partners)
- A wide variety of measures is being implemented now. Also to fill a climate measures toolbox.

https://www.vbne.nl/thema/klimaatakkoord


27 Febr; + 19 degrees
Thank you !
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