

# **Preparation of GHG reports in the LULUCF sector – progress in European countries**

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**–  
on behalf of the COST E43 WG2 questionnaire evaluation team  
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# Background and goal

- New IPCC guidelines for reporting GHG in LULUCF (2003) ↓
  - Need of updated reporting systems
- 

WHERE ARE THE COUNTRIES NOW?

Goal:

- state-of-the art in carbon reporting
- **COST E43 questionnaire**
- *utilization of National Forest Inventories*



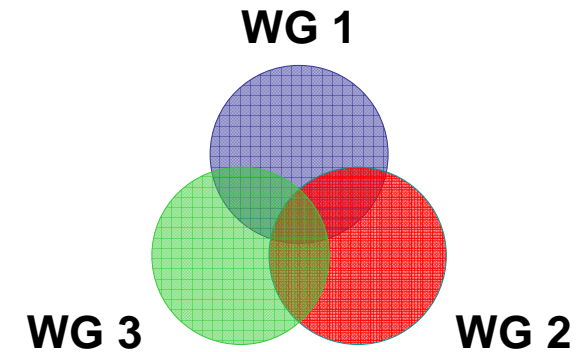
# What is COST E43?

- Title:
  - Harmonization of **NFI** National Forest Inventories in Europe: Techniques for Common Reporting
- Action leader:
  - Erkki Tomppo
- Objective:
  - to produce up-to-date transparent and comparable information



# COST E43

= three workgroups



1. Definitions and measuring practices of NFIs
2. Estimation procedures for carbon pools and carbon pool changes
3. Indicators and estimation procedures for assessing biodiversity



# Material and methods

- Questionnaire to EU countries (COST E43 WG2 members)
- Answers not corrected (objective analysis)
- Obvious contradictions and misunderstandings omitted
- Results: subjective selection of the most relevant information



19 responding countries





# Land use issues



- Forest definition applied

<b>FAO</b>	<b>42%</b>
<b>National</b>	<b>53%</b>
<b>Undecided</b>	<b>5%</b>



# Land use issues



- Approaches to estimate land-use change

<b>Sampling</b>	<b>32%</b>
<b>Sampling and land cover/use maps</b>	<b>32%</b>
<b>Sampling and other</b>	<b>5%</b>
<b>All three sources</b>	<b>16%</b>
<b>Land cover/use maps</b>	<b>16%</b>



# Land use issues



- Is NFI used for land-use change detection?

<b>Yes</b>	<b>74%</b>
<b>Potential</b>	<b>11%</b>
<b>No</b>	<b>16%</b>
<b>Undecided</b>	<b>0%</b>



# 5 carbon pools to report



1. Above-ground biomass
2. Below-ground biomass

**Living  
Biomass**

3. Dead wood
4. Litter

**Dead  
Organic  
Matter**

5. Soil organic matter

**Soils**



# Above-ground biomass



- - includes only trees, no other vegetation

<b>Yes</b>	<b>42%</b>
<b>No</b>	<b>16%</b>
<b>Undecided</b>	<b>42%</b>



# Above-ground biomass



- Does it include tree foliage?

<b>Yes</b>	<b>68%</b>
<b>Yes, conifers</b>	<b>16%</b>
<b>No</b>	<b>11%</b>
<b>Undecided</b>	<b>5%</b>



# Above-ground biomass



- Stock change derived from...

<b>Measurements</b>	<b>89% of 100%</b>
<b>Models</b>	<b>53% of 100%</b>
<b>IPCC defaults</b>	<b>5% of 100%</b>
<b>Country defaults</b>	<b>21% of 100%</b>
<b>Other</b>	<b>5% of 100%</b>



# General methods for stock change



- Default method

$$\Delta C = \sum_{ijk} [A_{ijk} \cdot (C_I - C_L)_{ijk}]$$

Area  
Increment  
Loss

- Stock change method

$$\Delta C = \sum_{ijk} (C_{t_1} - C_{t_2}) / (t_2 - t_1)_{ijk}$$

Time 1  
Time 2



# Above-ground biomass



- General method applied for stock change:

<b>Increment &amp; removal</b>	<b>37%</b>
<b>Stock change</b>	<b>32%</b>
<b>Both</b>	<b>26%</b>
<b>Other</b>	<b>5%</b>



# Above-ground biomass



- Biomass estimation by

BEF	47%
BF	21%
BEF and BF	21%
BEF and other	5%
Other	5%

*BEF = Biomass expansion factor*  
*BF = Biomass function*



# Below-ground biomass



- Estimation aided by

<b>BEF</b>	<b>42%</b>
<b>BF</b>	<b>21%</b>
<b>Both BEF and BF</b>	<b>21%</b>
<b>Undecided</b>	<b>16%</b>

*BEF = Biomass expansion factor*  
*BF = Biomass function*



# Deadwood



- Different limits to qualify:
  - Min. diameter from 0 to 35 cm (mostly 10 cm)
  - Sometimes length, height or age included
  - Sometimes different limits for standing and lying deadwood



# Litter



- Does it include F and H horizons?

<b>Yes</b>	<b>63%</b>
<b>No</b>	<b>11%</b>
<b>Undecided</b>	<b>26%</b>



# Litter

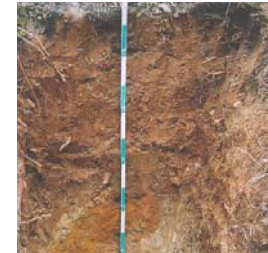


- Estimation method

<b>Measurements</b>	<b>74% of 100%</b>
<b>Models</b>	<b>42% of 100%</b>
<b>IPCC defaults</b>	<b>32% of 100%</b>
<b>Country defaults</b>	<b>32% of 100%</b>
<b>Undecided</b>	<b>5% of 100%</b>



# Soil

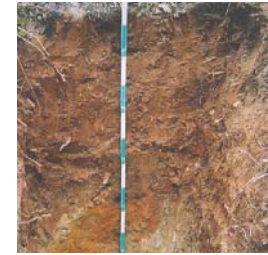


- Does it include F and H horizons?

<b>Yes</b>	<b>26%</b>
<b>No</b>	<b>32%</b>
<b>Undecided</b>	<b>42%</b>



# Soil

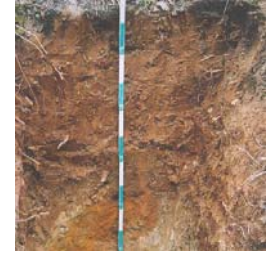


- Are organic soils treated separately?

<b>Yes</b>	<b>47%</b>
<b>No</b>	<b>5%</b>
<b>Undecided</b>	<b>47%</b>



# Soil



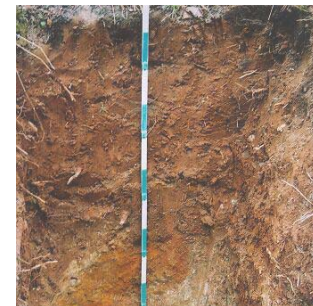
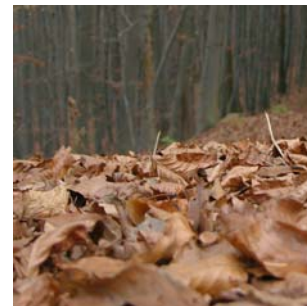
- Estimation method

<b>Measurements</b>	<b>58% of 100%</b>
<b>Models</b>	<b>53% of 100%</b>
<b>IPCC defaults</b>	<b>37% of 100%</b>
<b>Country defaults</b>	<b>16% of 100%</b>
<b>Other</b>	<b>5% of 100%</b>
<b>Undecided</b>	<b>5% of 100%</b>



# NFI data on 5 carbon pools (%)

	Yes	Yes, potentially	No	Undecided
Above-ground biomass	84	11	5	-
Below-ground biomass	47	11	26	16
Deadwood	58	32	11	-
Litter	42	32	21	5
Soil	37	26	21	16





# KP requirements

- Reporting ARD (since 1990) is mandatory
- Forest definition to be adopted by 2006:
  - min. height (2-5 m)
  - min. canopy cover (10-30 %)
  - min. area (0.05-1.0 ha)
- Optional reporting on Forest Management (and other activities) to be decided by 2006



# KP - definitions



- Adopted forest definition

<b>Same as for UNFCCC reporting</b>	<b>74%</b>
<b>Undefined</b>	<b>21%</b>
<b>Not answered</b>	<b>5%</b>



# KP - baseline



- Data for the baseline year (mostly 1990)

<b>From NFI measurements</b>	<b>53%</b>
<b>From NFI measurement and other sources</b>	<b>16%</b>
<b>From other sources</b>	<b>32%</b>



# KP – ARD activities



- The basis for ARD estimation

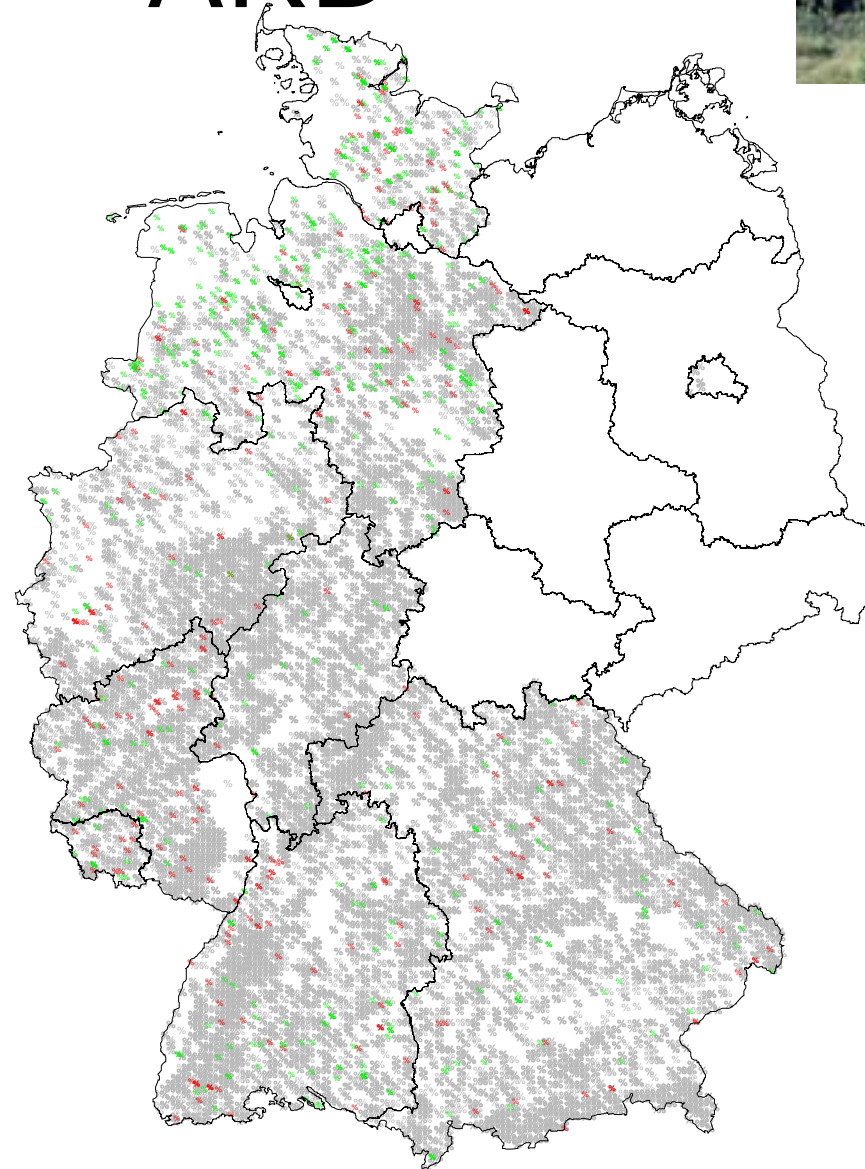
<b>Land cover/use maps</b>	<b>16%</b>
<b>Sampling</b>	<b>37%</b>
<b>Land cover/use and sampling</b>	<b>21%</b>
<b>Land cover/use maps and other methods</b>	<b>11%</b>
<b>Sampling and other methods</b>	<b>5%</b>
<b>Other</b>	<b>11%</b>



# KP - ARD



- The basis for ARD estimation (Example)





# KP – area identification



- Area identification methods

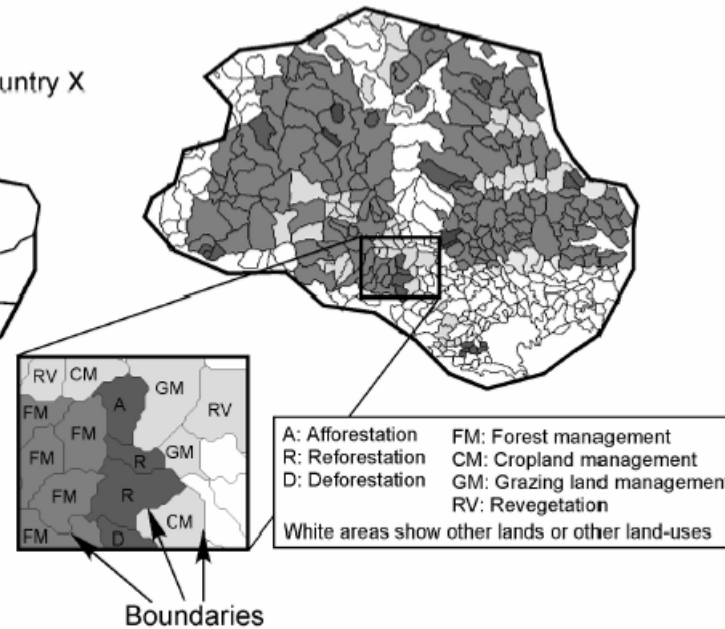
## Reporting Method 1

A geographic boundary encompasses units of land or land subject to multiple activities.



## Reporting Method 2

A geographic boundary encompasses units of land or land only subject to a single activity.





# KP – area identification



- Reporting method selected for area identification

<b>Identification of areas encompassing units of ARD lands (GPG reporting method 1)</b>	<b>47%</b>
<b>Identification of individual units of ARD lands (GPG reporting method 2)</b>	<b>37%</b>
<b>Not yet decided</b>	<b>16%</b>



# KP – voluntary activities



- Election of Forest Management to report

<b>Elected as an activity</b>	<b>32%</b>
<b>Not elected</b>	<b>11%</b>
<b>Not yet decided</b>	<b>58%</b>



# KP – use of NFI data



- Utilization of NFI data

	<b>Basis for ARD estimation</b>	<b>ARD area identification</b>
<b>Yes</b>	<b>58%</b>	<b>47%</b>
<b>Yes, potentially</b>	<b>26%</b>	<b>32%</b>
<b>No</b>	<b>11%</b>	<b>11%</b>
<b>Undecided</b>	<b>5%</b>	<b>11%</b>



# Conclusions

- NFI importance increases
- EU countries are far from being harmonized in reporting carbon stock change
- Many decisions yet to be made, specifically on Kyoto Protocol issues!
- Collaboration important for setting-up new reporting systems



# Acknowledgement

- COST E43 WG2  
questionnaire evaluation team



(Photo by) Emil Cienciala