

COST Action E43 Working Group 2 minutes – 14 April 2005

Present

Status	Name	Surname	Country
WG2 member	Michael	Prskawetz	Austria
	Emil	Cienciala	Czech Republic
	Ingeborg	Callesen	Denmark
	Lars	Vesterdal	Denmark
	Endla	Asi	Estonia
	Erkki	Tomppo	Finland
	Thierry	Belouard	France
	Antonie	Colin	France
	Karsten	Dunger	Germany
	Gerald	Kändler	Germany
	Vittorio	Tosi	Italy
	Terje	Gobakken	Norway
	Gheorghe	Marin	Romania
	Tibor	Priwitzer	Slovak Republic
	Gal	Kusar	Slovenia
	Göran	Ståhl	Sweden
Gert-Jan	Nabuurs	the Netherlands	
Mark	Broadmeadow	United Kingdom	
Hannes	Schweiger	Austria	
WG2 guest/expert	Esther	Thürig	Switzerland
	Ron	McRoberts	USA

Agenda

Introduction of participants

Questionnaire report

Planning of next steps

- Task force meeting in Graz
- Task force on identifying harmonisation options
- Meeting in Germany in October
- STSM on sensitivity analysis
- Questionnaire number 2

Country reports on LULUCF reporting systems

- Identify important issues for the task force to consider

Introductory issues

US/Canadian representative(s) would be keen to be involved on an on-going basis; to be discussed at Management Committee meeting.

STSM covers travel costs and accommodation (not salary) for arranging meetings and collaborative work.

Questionnaire evaluation – Emil Cienciala

Questionnaire outline

- Report from STSM circulated.
- Motivation – updated system.
- Objective of questionnaire – to assess the state of the art in Europe.

- Acknowledged that it will be outdated rapidly – should be completed rapidly – second questionnaire will be circulated.
- 19 countries responded; no answers corrected – therefore objective assessment; obvious errors were excluded from analysis.
- What to do about countries who have not yet submitted responses? Encourage.
- The questionnaire covers all LULUCF activities (where appropriate), not just forest stocks.

Questionnaire 'highlights'

- NFI used for 74% of LULUC transfers – surprisingly high.
- 42% use NFI for aboveground biomass estimates.
- 89% include measurements in estimates of stock changes.
- 74% of countries make some measurements of litter as part of their NFI.
- Clearly a problem with F&H horizons being included in both litter and soil carbon pools.
- 58% of countries include some soil measurements for soil carbon pool estimation.
- 53% of countries will use NFI data for the baseline year (1990). The UK can't.
- 58% of countries will use NFI data for ARD estimation.
- 32% will report forest management – 58% undecided.
- Very few responded to questions on why NFI data are not being used.

General points

- CARBOINVENT are publishing a paper in the near future on definitions of biomass functions and biomass expansion factors.
- ARD transfer is an interesting issue. In terms of carbon, deforestation is far more important than its consideration purely in terms of area.
- Definitions of forests must be adopted by 2006, as does a decision on whether to report on forest management activities (the UK is likely to).
- KP area identification is an important issue.
- The value of NFIs for KP reporting needs to be made outside of forestry issues, providing an argument for enhanced funding.
- JRC are interested in the data collected.
- Litter – when should it be sampled – before or after new litter fall?
- GPG states that the O horizon is included as litter, not as soil. Need to define exactly what is included – the GPG were written to be flexible, but with precise definitions given by individual countries.
- MCPFE provides definitions of what is defined as deadwood (10 cm diameter x 2 m length, as a minimum).

Publication based on first questionnaire

A publication based on the analysis of the first questionnaire will be prepared (Emil to co-ordinate) and submitted to a climate change policy related journal. It was agreed that the authorship will be based on the Gembloux taskforce meeting plus the STSM analysis team. Emil will also present the paper at the Carboinvent meeting in Graz in May. The drafting of a similar article during summer 2006, based on the second questionnaire was discussed. It was felt that the publication would be of benefit to the European Commission to aid harmonisation of reporting processes across the EU.

Revision of questionnaire

It was decided that a second questionnaire should be prepared and circulated when countries are more certain about the methods that will be applied. Countries must submit preliminary methods by 16th January 2006. The revised questionnaire will therefore be circulated at the end of January 2006. Final methods must be reported by end of 2006, allowing the results of the second questionnaire to influence the final

methods adopted. It was suggested that the task force for the second questionnaire could analyse methodology described in NIRs to augment the information collected through the first questionnaire. However, this would probably not yield much new information as NIRs are very variable in detail. NIRs also based on past methodologies, not what will happen in the future.

An application for funding will be tied to on-going activities of E43, and prepared by Emil/Goran. The make-up of the task force to prepare the second questionnaire during summer 2005 was agreed as: Emil (co-ordinator), Mark, Thierry, Gert-Jan and Erkki. The taskforce will present a preliminary report to WG2 at the Freiburg meeting in October.

Additional questions for the second questionnaire

- More on what definitions of forest management in individual countries
- More on methodologies of ARD estimations
- More on how models are used to supplement NFI data
- More information on biomass functions – what are the functions (or citations)
- Estimating increment and harvest (IPCC default, country specific etc.)
- How are models and measurements combined? How are different harvestable fractions treated?
- How is mortality dealt with?

Organisation

Task force meeting in Graz in May at Carboinvent conference. Composition of taskforce defined at Florence meeting in December 2004. (Goran, Erkki, Emil, member from Italy).

Task force on harmonisation options. Preliminary ideas will be presented at the Freiburg meeting in October – primarily reference definitions for core variables, and identification of reference methods where harmonisation could proceed. Harmonisation is needed because IPCC GPG allows so much flexibility. An article will be drafted, with an application for funding to support the work. Task force composition: Erkki, Goran, Vittorio, Karsten.

A STSM on sensitivity analysis was proposed – this STSM will be discussed further at the Freiburg meeting in October, partly building on the work of the harmonisation task force.

The future work outline, 2005-2008, was agreed in principle.

Country reports of LULUCF sector reporting

UK – Mark Broadmeadow. Not currently based on NFI. The only data requirements are areas of new planting and deforestation, providing input to the carbon accounting model, CFLOW. A hybrid system will be introduced in 2006 which will use inventory data to provide regional estimates of standing carbon, with planting and deforestation data superimposed on the baseline to provide estimates of stock change.

Sweden – Goran Stahl. Current system based on inventory (35000 permanent plots), with a five-year cycle. What is the relative importance of area of ARD lands in carbon reporting in the different countries.

Switzerland – Ester Thürig. Inventory system (10000 plots, 1.4 km grid). Third inventory cycle in 2004-6. Stratified by region, altitude, conifer/broadleaf and large trees/small trees for biomass expansion factors. 3 m minimum height. Managed forest defined as all forest with the exception of tracks, areas permanently without

tree cover, inaccessible forest and scrub forest. Stock change approach based on single tree measurements, less cut and mortality. Allometric relationships based on measurements of 38000 (stemwood) branches (12000) twigs (12000) coarse roots (100) trees. Total BEF varies between 1.41 and 1.7 for conifers and 1.46 to 1.7 for broadleaves.

- What is volume suitable for industrial processing – bark, stump, branches?
- What is the annually extracted volume of roundwood – bark, stump, branches?
- How are dead trees treated? As removals if removed from forest.
- How should stochastic events such as windthrow be treated – use forest inventories for large scale events or update inventories using scenario models?

Germany – Gerald Kandler. To date, Germany has used the increment method (modelled growth less harvesting statistics). Will not move to stock change method based on two inventories. In FRG, 1987 baseline based on first NFI. In GDR, 1993 baseline based on forest management planning database, not inventory. 2nd inventory covered all of Germany. 54000 permanent sample plots in forests. 372000 trees measured. 2, 2.8 or 4 km grid. Reference year of inventory is 2002. Only aboveground and below ground pools are included – no data for other pools. SOC will be assessed separately. No data for litter or deadwood at beginning of assessment period. GDR – aggregated data, so no spatial analysis possible. Planning database also underestimates stocks by ~10%. Analysis of effect of different assumptions (root:shoot ratio, wood densities etc.) presented. Absolute values vary, but difference between the two NFIs is very small. Comparison of methods: increment change, 8.7 MtC yr⁻¹; stock change method, 14 or 18 MtC yr⁻¹ (depending on whether roots are accounted for). Will investigate the effects of including trees <7 cm dbh.

- Problem of underestimating stocks and stock changes using aggregated, forest planning data based on yield models.

Italy – Vittorio Tosi. New NFI underway 2003-2006 *National inventory of forests and forest carbon sinks*. Phase 2 assessing 30000 sample plots. Phase 3 will assess a sub-set of 10000 sample plots from phase 2. Definitions 0.5 ha, 5 m height, 20 m width, 10% cover. 2 m height is used as a definition to cover macchia vegetation. Land use transfers will be based on differences between two inventories. 3000 sample trees being assessed to develop ~20 species-specific above-ground BEF/BF models. 2.5 cm dbh minimum. Biomass of shrubs and small trees is estimated in each NFI plot. OWL and shrubland is estimated using other models (in preparation), based on height and cover. Biomass expansion for roots has not been decided – default values will probably be applied. Deadwood assessed as coarse or fine (>10 or 2.5>10< cm). Litter biomass determined in sub-plot of NFI plots. SOC measured in NFI subplots, but approach to stock changes not decided yet. ARD – A/R split is at 50 years. Post 2002, AR will be registered as grant-aid applications (for carbon sequestration); 1990-2002 AR will emerge from NFI.

Finland – Erkki Tomppo. CO₂ uptake resulting from fertilisation included (minor) as are burning emissions; woodland defined as 10% cover. Definition of forest management still under discussion. Inventory – 75000 permanent plots, 600000 trees, all land use classes; first inventory in 1921. Aboveground biomass – all trees above 1.3 m. Ground vegetation included. SOC – different approaches for mineral and organic soils – stock change models (YASSO) used for both – annual litter production used to estimate litter, deadwood, SOC stock changes. New biomass functions under development for birch, Scots pine and Norway spruce, including below-ground functions.

- Definition of grassland if expected to become forest.
- Is non-wooded forestry land grassland or OL?

- Should non-vegetated (mineral soil) land be classed as OL, OWL or grassland?
Can be reported as woody material on grassland.
- How to estimate and identify LULU transfers?

Dynamic peatland emission factors under development for CO₂, CH₄ and N₂O. Input data – water table, temperature, radiation. Based on specific monitoring plots and extrapolated to give regional estimates.

Denmark – Ingeborg Callesen. No NFI at present. 1990 inventory was questionnaire based. Systematic grid now being established. No soil information. Database being developed from research plot information. Repeated measurements from research plots undergoing power analysis to identify how many samples will be required to identify change – methodological development for soil survey. Also, if only 30 cm soil carbon is measured, how to expand to 1 m – SOC expansion factors.

Netherlands – Gert-Jan Nabuurs. Concentrating on land use change; why do half EU countries who report on soil carbon exchange report a large source and the other half, a large sink. Very detailed land cover maps are available – 25 m pixel size. Deforestation rate of ~2000 ha yr⁻¹ and afforestation rate of ~3000 ha yr⁻¹. Large movement of forest areas (in total forest area of ~400000ha) is therefore occurring in Europe. Definition of forest: 0.5 ha, 30 m minimum. Deforestation needs to be looked at in more detail because of the potentially large source strength.

Discussion of country presentations

It was proposed that outstanding questions would be collated, possibly putting them on the website of WG2. All presentations will also be converted to PDF handouts and placed on the web-pages.

Outstanding questions

- When grazed land is abandoned, allowing woodland establishment, how should it be dealt with? (human-induced land use change, not natural).
- What is the relative importance of area of ARD lands in carbon reporting in different countries?
- Definition of grassland if expected to become forest.
- Is non-wooded forestry land grassland or OL?
- Should non-vegetated (mineral soil) land be classed as OL, OWL or grassland?
- Can be reported as woody material on grassland.
- How LUC transfers be identified and areas estimated?
- What is volume suitable for industrial processing – bark, stump, branches?
- What is the annually extracted volume of roundwood – bark, stump, branches?
- How are dead trees treated? (As removals if removed from forest).
- How should stochastic events such as windthrow be treated – use forest inventories for large scale events or update inventories using scenario models?
- How should underestimates of stocks and stock changes using aggregated, forest planning data based on yield models be dealt with?
- How should grassland be defined if it is expected to become forest?
- Is non-wooded forestry land grassland or OL?
- Should non-vegetated (mineral soil) land be classed as OL, OWL or grassland?
(Can be reported as woody material on grassland).
- How to estimate and identify LULU transfers?
- If soils information is only available to a depth of 30 cm, how can the depth be extended to 1 m – ie SOC expansion factors.

Conclusions

- Increasing precision for above-ground biomass, compared to litter, soil and below-ground biomass. Approaches to estimates of carbon stock changes in soils and associated with land use change need much attention.
- Many countries developing new biomass expansion factors; these data-sets could be collated by the group.
- Interpretation of IPCC GPG for the five carbon pools and land use classes varies between countries; this is allowed by the flexibility in the GPG.
- Sensitivity analysis of stock change estimates to the quality/resolution/'tier approach' of data-sets should form an important part of method development.
- Estimates of uncertainty will be an important focus for WG2.
- Estimates derived using yield tables could be significantly in error for the (IPCC default) increment method.
- WG2 should formulate recommendations to ensure that estimates of carbon stock changes are comparable between countries.

Mark Broadmeadow

15 April 2005

Additional notes by
Emil Cienciala, Göran Ståhl
29 April 2005