Developments toward spatially explicit GHG inventories (WP1-WP3)

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Online

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LAND REPRESENTATION IN IPCC2006 GL

Land representation for LULUCF GHG estimation need to be:

- consistent (through time series)
- complete (whole country-Managed/unmanaged)

	Land-Use and Land-Use Changes			
	Data sources	Quantification of land-use changes	Info on previous or following land-use	Location of land-use changes
Approach 1 Total land use area (no location of LUC)	Statistics	Net-changes	NO	NO
Approach 2 total land use area, including changes between categories	Info on individual LUC e.g. Nat. Statistics + LUC sampling	Gross-changes	YES	NO
Approach 3 Spatially explicit LUC representation	Wall to wall Statistical sampling	Gross-changes	YES	YES

What's new in the EU LULUCF reporting?

LULUCF Regulation (841/2018) 2021-2030 (reporting from 2023)

REGULATION (EU) 2018/841 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 30 May 2018

on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU

(Text with EEA relevance)

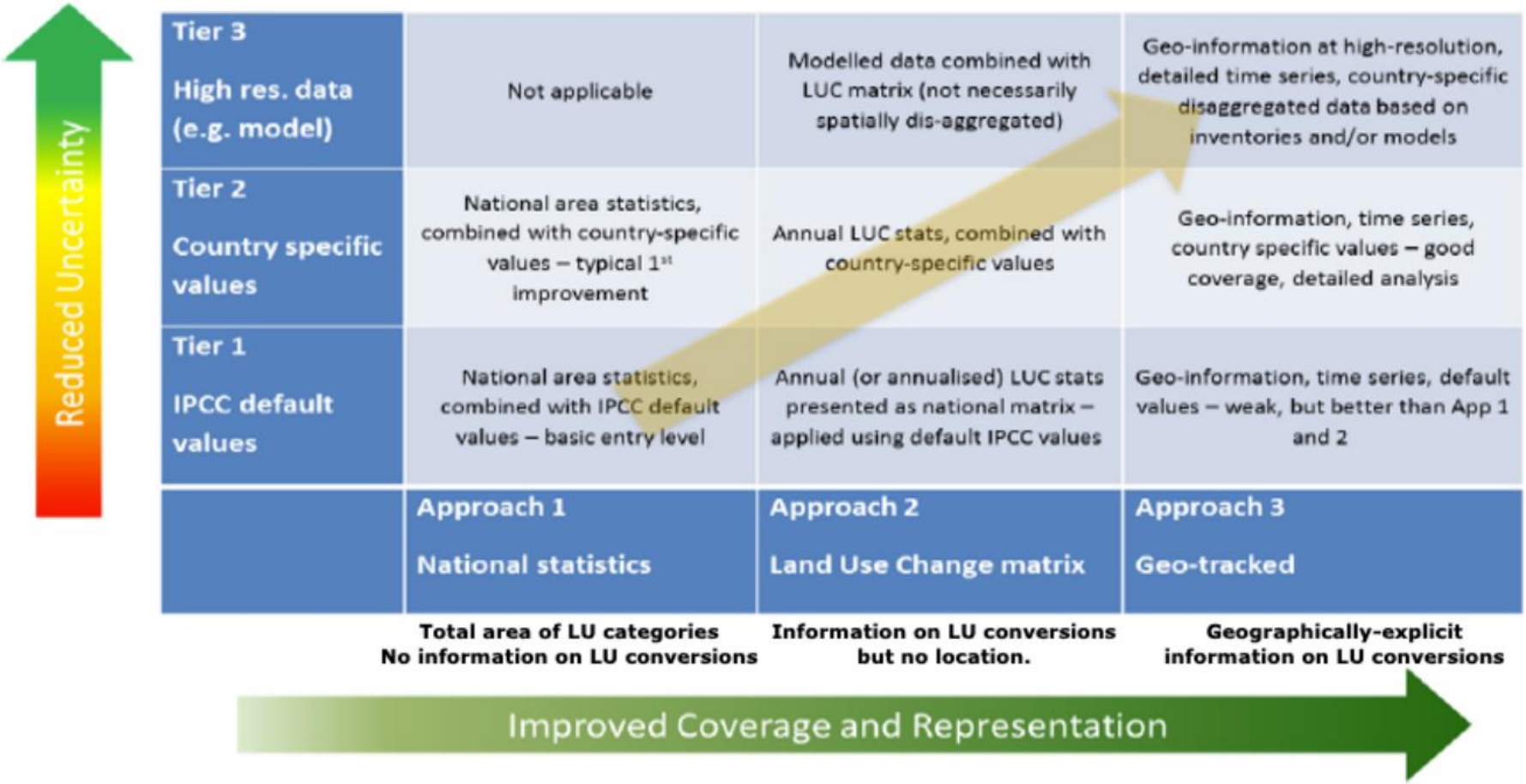
Approach 3: Geographically-explicit land-use conversion data in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

For emissions and removals for a carbon pool that accounts for at least 25-30 % of emissions or removals in a source or sink category which is prioritised within a Member State's national inventory system because its estimate has a significant influence on a country's total inventory of greenhouse gases in terms of the absolute level of emissions and removals, the trend in emissions and removals, or the uncertainty in emissions and removals in the land-use categories, at least Tier 2 methodology in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

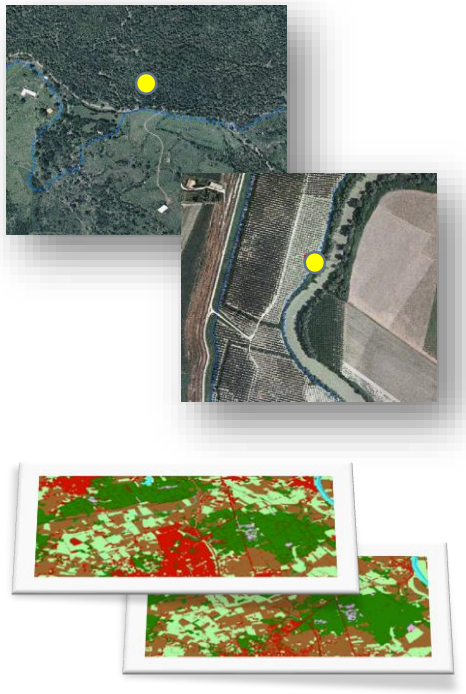
Member States are encouraged to apply Tier 3 methodology, in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.'.

What's new in the LULUCF reporting?

LULUCF Regulation (841/2018) 2021-2030 (reporting from 2023)



APPROACH 3: HOW TO DO IT?



- **Sample based methods**:

from ground surveys (such as a national forest inventory or national land survey) or remote sensing. (provides accurate statistical representation of LUC , no track of specific area)

- **wall-to-wall maps**

LU/LC maps that, when combined with other data, can be used to generate land-use and land-use change information (full tracking of LUC areas)

- **statistical survey methods**

Info on land use and **management practices**; this data is often used in combination with other data to develop a complete land use estimate

These methods are not mutually exclusive

Year	LULC	2013									Total Area
		AL	BuA	DeF	OF	DF	WL	Ri	SC	WeL	
1991	AL	561.40	33.80	6.19	181.18	8.97	63.39	4.65	5.63	7.67	872.88
	BuA	1.20	43.11	0.04	3.87	0.07	1.07	0.00	0.01	0.00	49.38
	Def	5.48	0.03	4.02	13.37	2.68	2.38	0.01	2.75	0.00	30.73
	OF	753.89	158.47	109.03	3542.82	208.28	595.47	4.66	156.75	0.58	5529.95
	DF	75.47	24.37	21.34	480.54	460.96	93.25	0.95	26.87	0.00	1183.75
	WL	41.04	10.01	8.01	194.75	4.74	80.35	1.12	11.41	0.02	351.45
	Ri	4.93	0.34	0.19	3.92	1.00	5.22	80.08	0.08	0.59	96.35
	SC	7.42	1.14	2.45	30.02	7.36	13.70	0.00	5.16	0.00	67.26
	WeL	3.02	0.00	0.00	1.77	0.00	2.44	0.06	0.00	3.81	11.11
	Total Area	1453.86	271.28	151.27	4452.26	694.06	857.27	91.55	208.65	12.68	8192.87

SURVEY ON SPATIALLY EXPLICIT ESTIMATION (WP3-WP1)

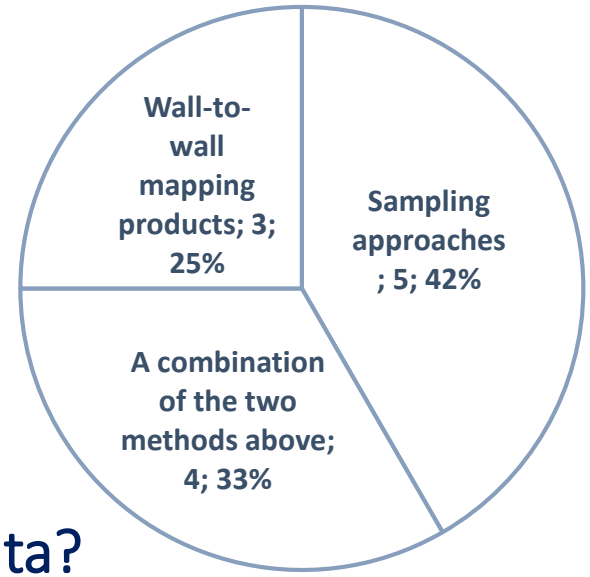
GAPS AND NEEDS TOWARDS SPATIALLY-EXPLICIT ESTIMATIONS OF FOREST-RELATED GHG EMISSIONS AND CARBON REMOVALS

- ESurvey: developed by WP1 and WP3 for better understanding of status and needs for spatially-explicit estimating and reporting for national GHG inventories
- Focus on LULUCF sector with a focus on forest-related categories (ref. Regulation (EU) 2018/841)

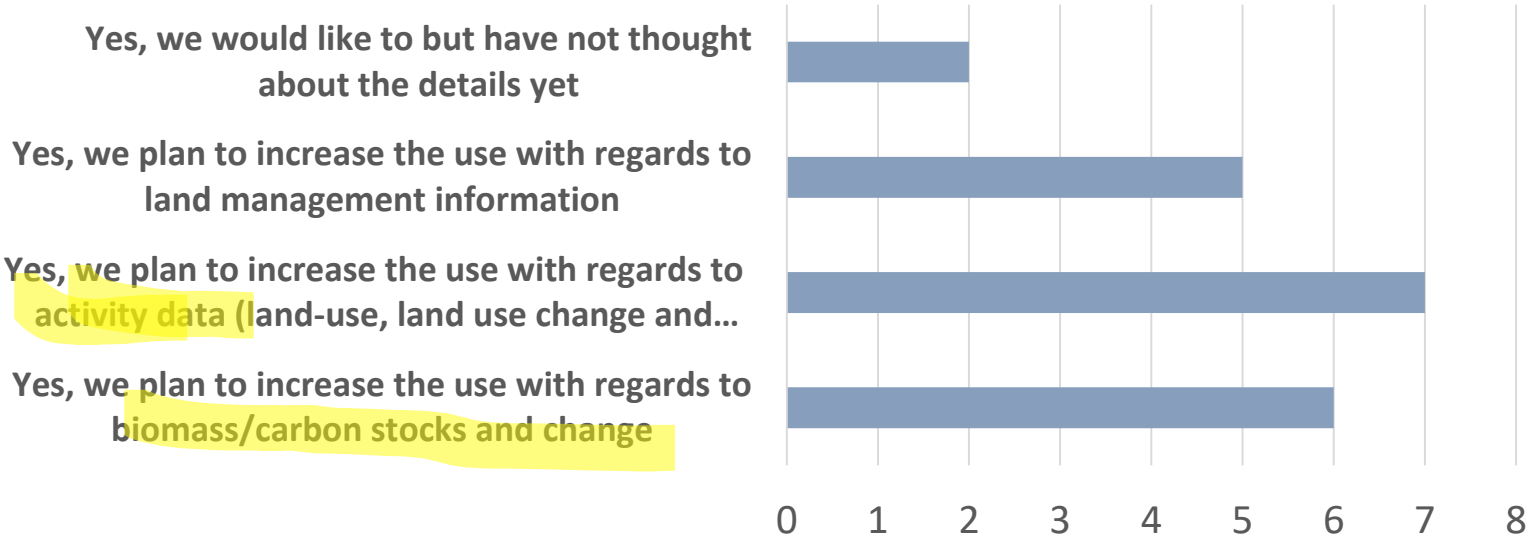
- 11 Respondents:
  - 9 EU Inventory agencies Ireland (Austria, Netherlands, Germany, Italy, France, Lithuania, Slovenia, Slovakia)
  - Turkey and Norway

STATUS AND PLANS FOR SPATIALLY-EXPLICIT DATA

Current use of spatially explicit data



Plans for the use of spatially explicit data?



REQUIREMENTS FOR RELEVANT SPATIALLY-EXPLICIT DATASETS

Criteria	Most common answer
Spatial resolution	10-30 m OR 0.01 – 0.09 ha (MMU)
Temporal frequency	Annual
Temporal range	Since 1990

In the absence of a complete time series, most respondents would consider the product, if the method to **reconstruct the time series with ancillary data can ensure consistency with IPCC guidelines**

Limitations / challenges on spatially-explicit estimating

Criteria	# replies
Limited availability of data sources and approaches (e.g., **spatial or temporal resolution**)	5
Limited potential to ensure a consistent land representation and/or consistency with **national definitions** (e.g., of forests)	5
Lack of temporal consistency or **complete time series**	4
Concerns that **accuracy and consistency of national estimations will decline**	4
Limited accuracy of available datasets and approaches	3
Lack of guidance on how to integrate novel spatial data sources/approaches with current approaches for national estimation	3
Lack of national capacity to deal with novel data sources and approaches (e.g., difficulties to process large size datasets)	2

AWARENESS OF EVOLVING DATA SOURCES AND APPROACHES

What are the **data sources and approaches you are fully familiar with?**

Available land cover/land use datasets for area change estimation	7
Remote sensing time series approaches for tracking forest dynamics and disturbances (e.g., forest change, fire and burned area data sets)	4
Forest and forestry **information models**	4
Process-based carbon models	3
Biomass density maps from remotely derived data	3

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2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Guidance on the use of biomass density maps for national GHG inventories

Biomass density maps can be used to enhance the stratification of ground carbon inventories, to improve the estimation of carbon emissions by increasing data density in under-sampled or inaccessible areas, and as an independent data source for verification purposes (provided that the field data were not used to predict the biomass density maps used for stratification).

Use of biomass maps for the estimation of carbon emissions at Tier 2 and Tier 3 levels can be achieved in several ways: