Synergies between the CAP new delivery model and LULUCF inventories

GTCAP

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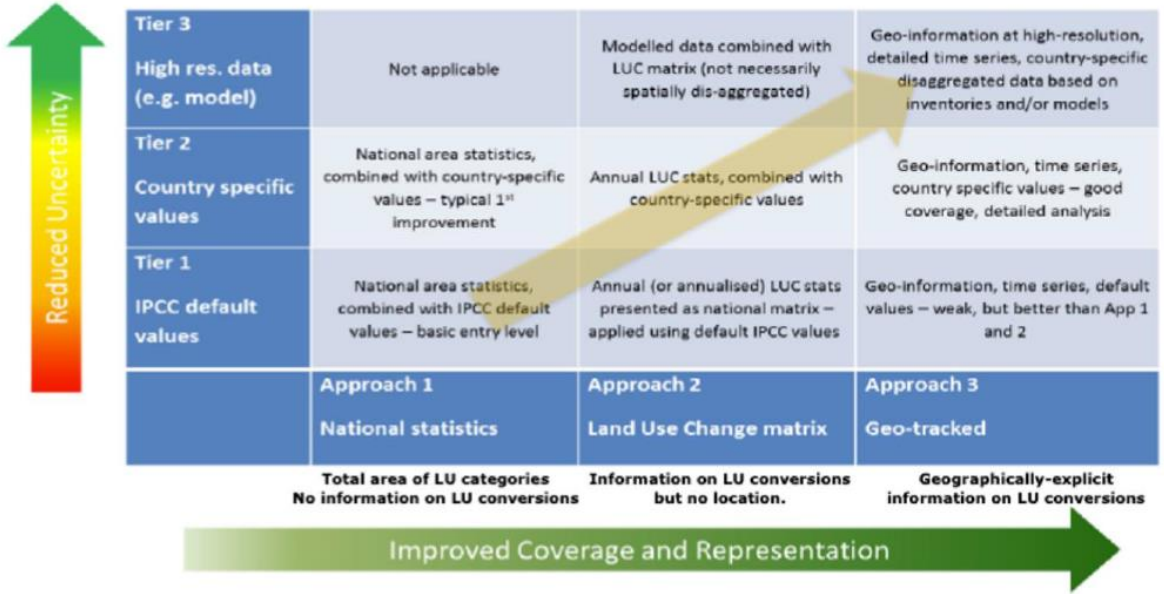
8 June 2021

Removals and emissions of GHG REGULATION (EU) 2018/841



Challenges in the agricultural land

- high **granularity** (millions of parcels)
- Multitude of management–environmental interactions
- **Soil-related** emissions/ removal (beside livestock)
- Lack of high-resolution inventories and model frameworks for all CO_2, N_2O and CH_4?

European Commission

Detecting changes in agricultural soils

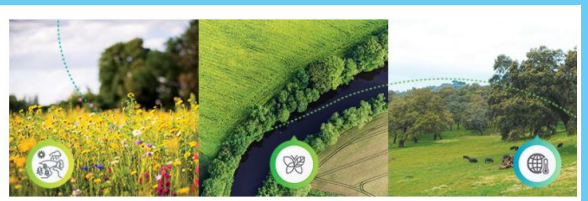
- CL remaining CL mineral soil ≈ 92% of area, 10% of CL soil emissions
- CL remaining CL organic soil ≈ 2% of area, 60% of CL soil emissions
- Land converted to CL ≈ 6% of area, 30% of CL soil emissions

(data from MS GHG inventories)

Small area with high uncertain emissions

Currently high area with likely small changes emissions/removals

but new expectation with the post-2020 CAP…



CAP strategic plans

- **Enhanced conditionality (new GAEC)**
- **Eco-schemes**
- **AEC pillar II**

20-30% budget for climate action (pillar I)

Biodiversity Strategy

Farm to Fork

granularity

European Commission

CAP new delivery model

Compliance → Performance

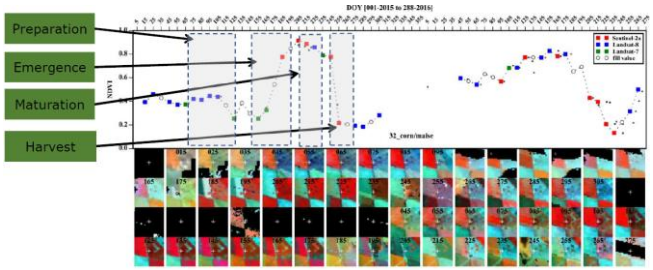
GSAA

LPIS-IACS

- Land Cover Classification (AL, PC, PG)
- Stable Ecological Focus Area/Landscape Features under GAEC
- RD agri-environment-climate measures

Check on spot on 5% sample

Copernicus
Europe's eyes on Earth



Check by Monitoring

- Crop recognition
- Activity detection (ploughing, mowing)
- GAEC and eco-schemes application (soil cover, grassland management, Landscape Features, EFA)

GTCAP support MS

Applicable to all parcels, all year

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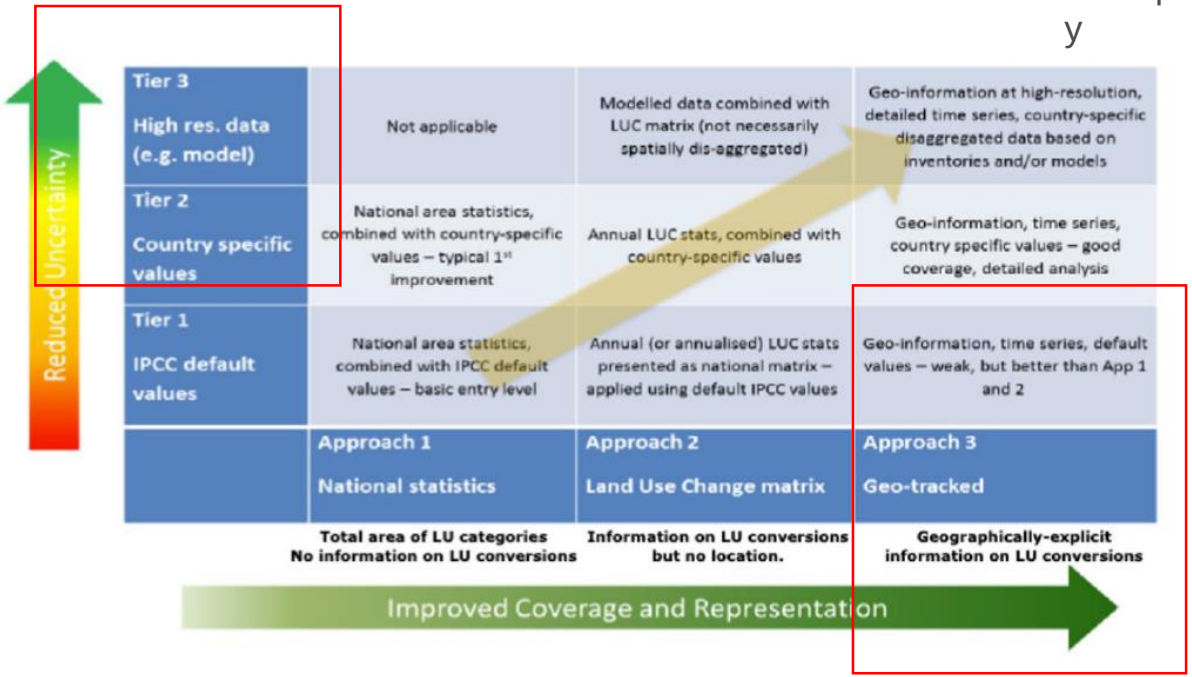
Synergies between CAP and LULUCF

GHG inventory community

Semantic, interoperability



Emissions/removals

Impact Indicator ?

CAP Performance

- Output and results indicators

CAP delivery model

- Spatial explicit information agricultural managed areas

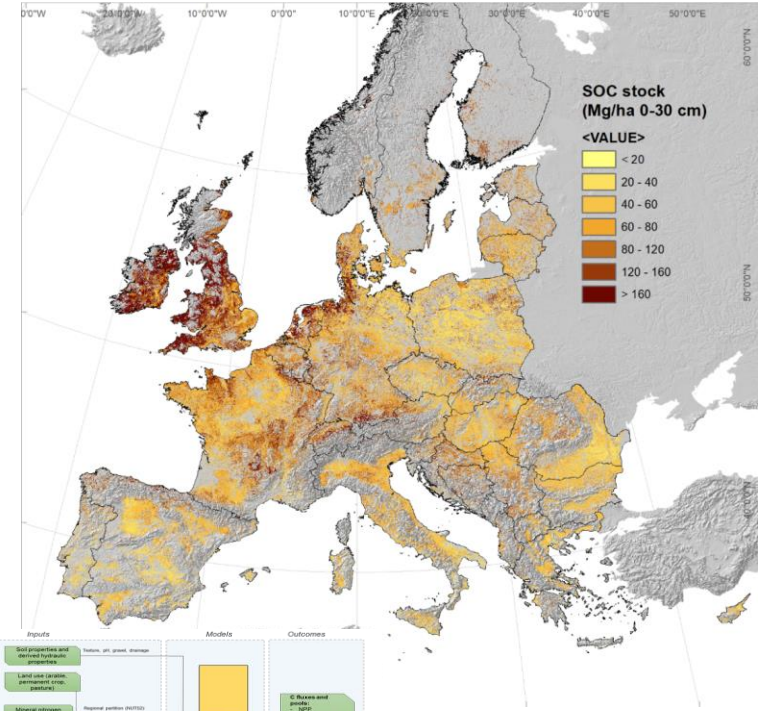
European Commission

TIER 3 – Spatial explicit

L 156/16 EN Official Journal of the European Union 19.6.2018

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.

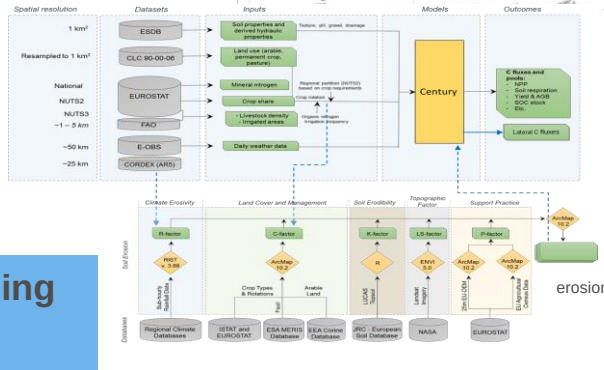
Member States are encouraged to apply Tier 3 methodology, in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.'.



ΔSOC = SOCr x Ac x EF → equally important!!!

Complexity of biogeochemical C and N cycles

- Non-linearity
- Variability in space and time
- Anthropogenic vs climate



JRC large-scale modelling

CENTURY – DayCent

European Commission

Coupling model – spatially explicit activity data

GSAA

LPIS-IACS

- stable land cover/annual land use

- Planting harvest date
- Cover (residue management, tillage)

- Soil properties

Bottom-up approach

CbM potentially offers an automatic model implementation!!!

Model input

```
12              Output month
1          Output interval
F             Weather choice
legnaro.wth
     1  129 LAST
     1  130 HARV H
     1  138 CULT I
     1  140 CROP C4
     1  140 PLTM
     1  160 FERT (4.N)
     1  275 LAST
     1  276 HARV G90S
     1  285 OMAD M2.LG
     1  290 CULT K
     1  295 CULT I
     1  300 CROP RYE
     1  300 PLTM
-999 -999 X
2              Block #    @HHHH_1302
2000          Last year
1              Repeats # years
1991           Output starting year
12              Output month
1          Output intervall
C             Weather choice
1       1 CROP G3FX
1      60 FRST
1     100 FERT (20.N)
1     140 HARV H
1     170 HARV H
1     200 HARV H
1     263 HARV H
1     304 LAST
1     305 SENM
1     310 EROD 0.2
-999 -999 X
```

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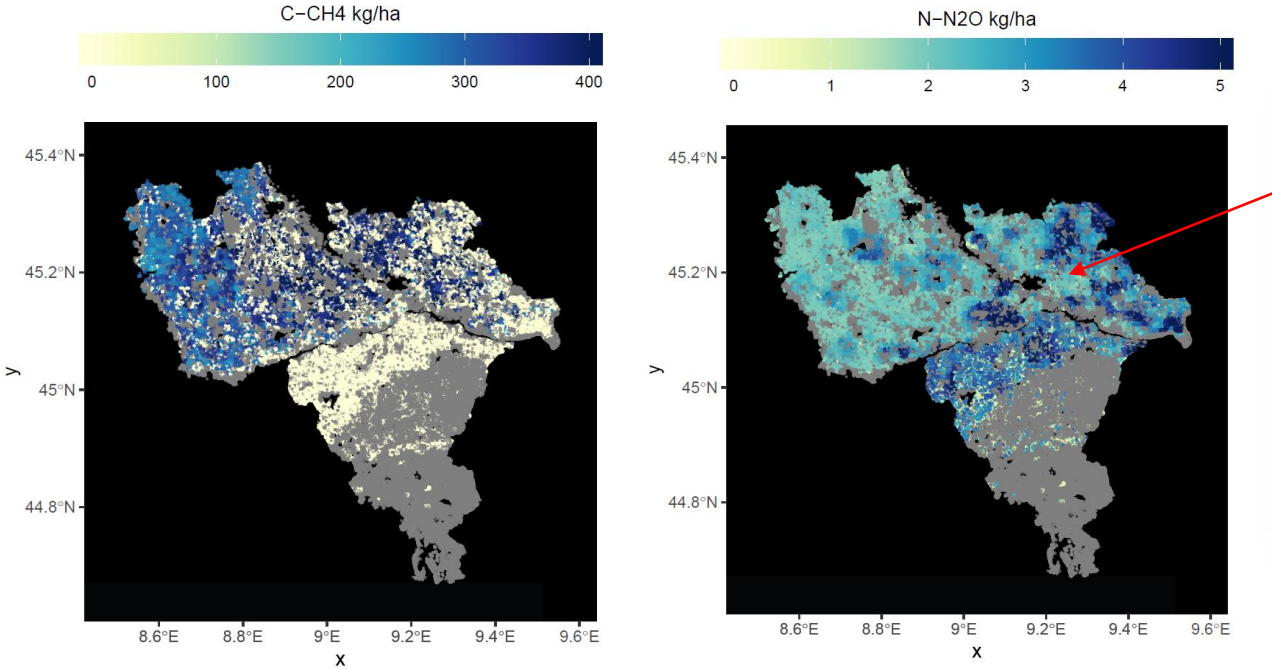
Coupling model – spatially explicit activity data



Example of DayCent downscaling which may become an operative system but in the future…

Organic soils: a key “common” issue

- **EU emissions from organic soils**

17 Mha -> 95 Mt CO_2

Land use subcategory	Area (Kha)	ICECF (tC/ha)	Emissions from Org. Soils. (Kt CO_2)
 4A1	12 264	[-2.60; 0.65]	13 631
4A2	407		1 494
 4B1	1 242	[-10.01; -1.00]	25 813
4B2	273		5 814
 4C1	4 132	[-6.80; 0.25]	42 150
4C2	354		5 683

85%

Large uncertainty EF

Annual European Union greenhouse gas inventory 1990–2018 and inventory report 2020

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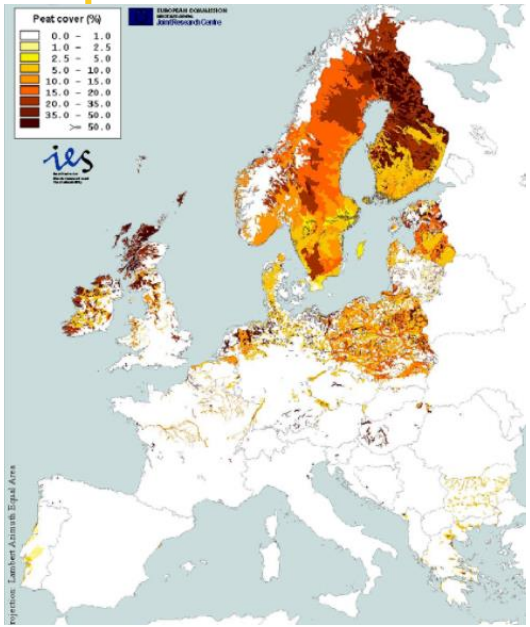
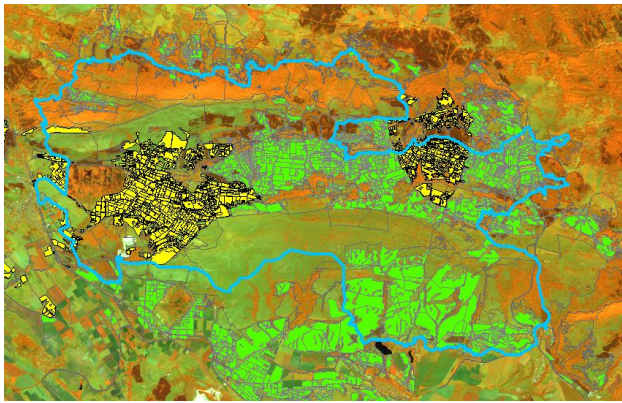
Where\what wetlands\peatlands are…



Jones *et al.*, 2006
Based on EUSM (histosols)

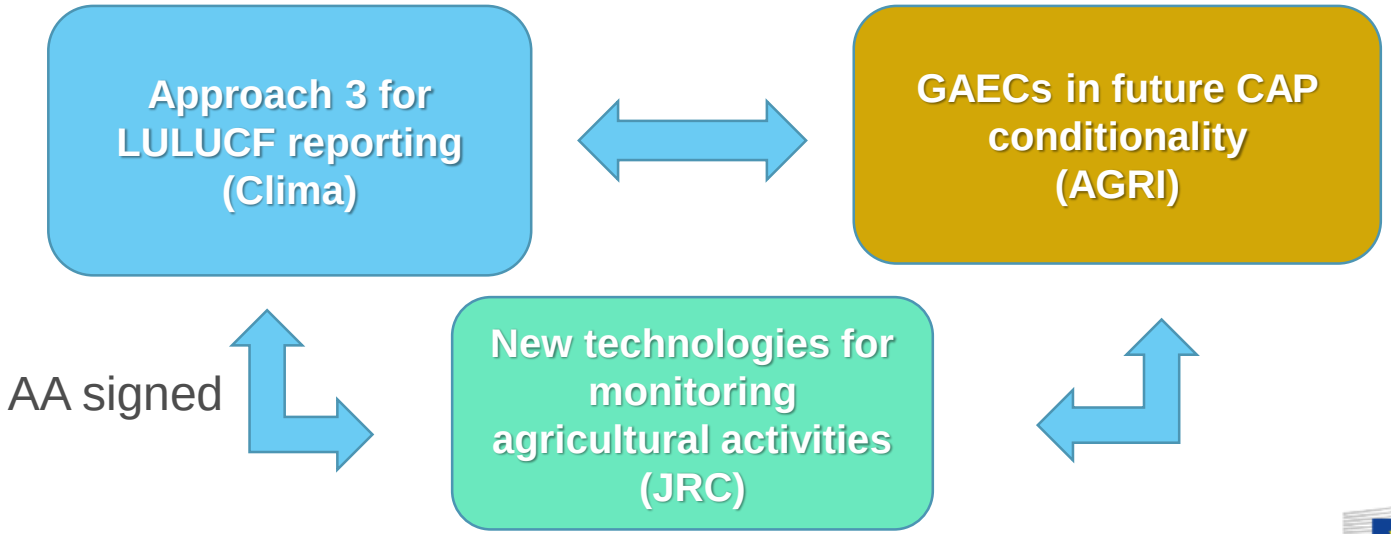
Tanneberger *et al.*, 2017
composite map of national datasets



SEPLA

The SEPLA project

"Ensure comprehensive inventory of wetlands and peatlands and address the monitoring of their preservation and restoration through the use of remote sensing and regularly updated geographically explicit datasets."



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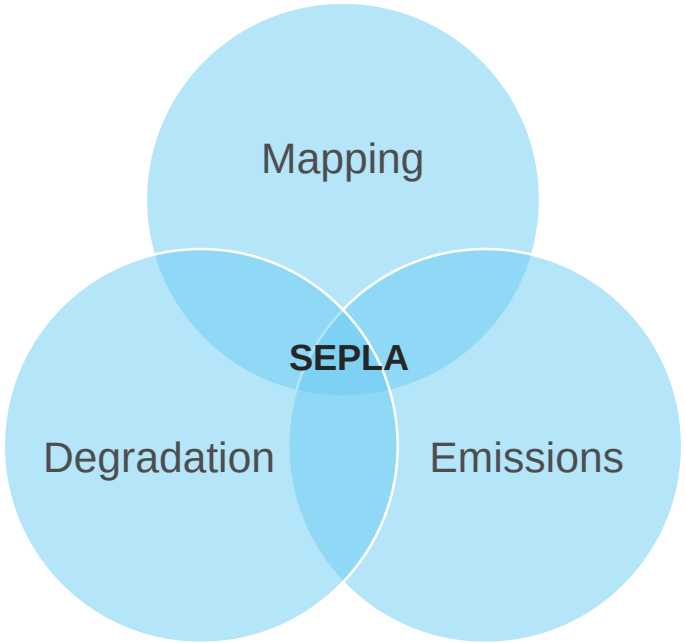
Interlink between mapping and processes



Drainage

Proxies

- Water table
- Bulk density
- C:N ratio
- Albedo-vegetation
- CO2
- CH4
- N2O

Key points

- **Can we make a interoperable monitoring framework working for CAP and LULUCF?**
- **Potential to couple spatial data, EO and modelling**
- **SEPLA can be a good “experiment” to link CAP and LULUCF community**

Thank you

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