Ecosystem accounting in the Netherlands

Earth Observation for Ecosystem Accounting

28 March 2017

Copenhagen

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Content

1. Update of natural capital accounting in the Netherlands
2. Using earth observation data in the Netherlands

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Part 1

Natural capital accounting in the Netherlands
- ongoing work –

- 2 year project, financed by Ministry of Economic Affairs and Ministry of Infrastructure and the Environment
- First pilot for the Netherlands
- Testing the SEEA EEA
- Physical supply and condition accounts and monetary supply and use accounts

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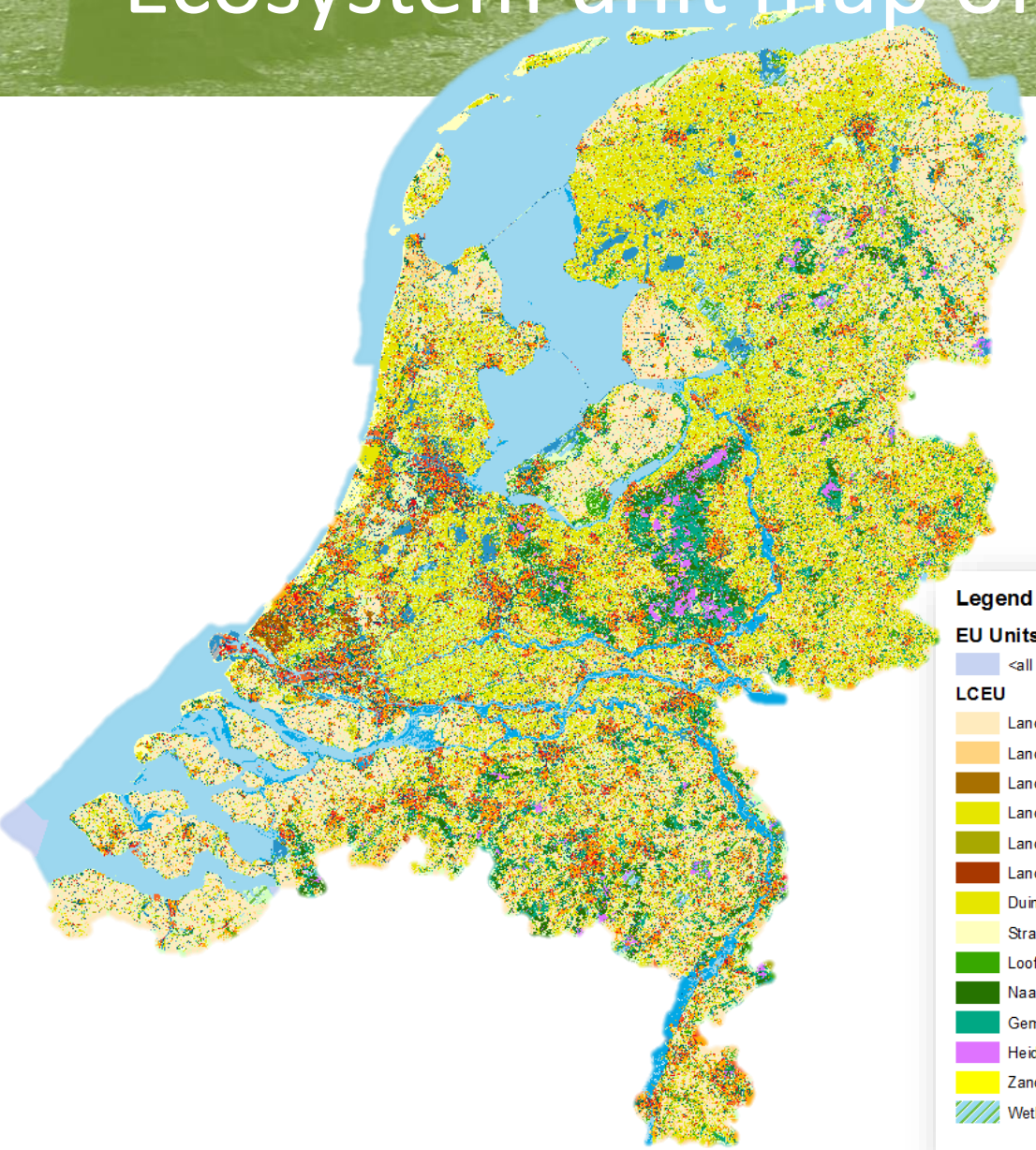
Ecosystem unit map of the Netherlands



Not based on RS but five different basemaps from CBS and cadastre

Legend

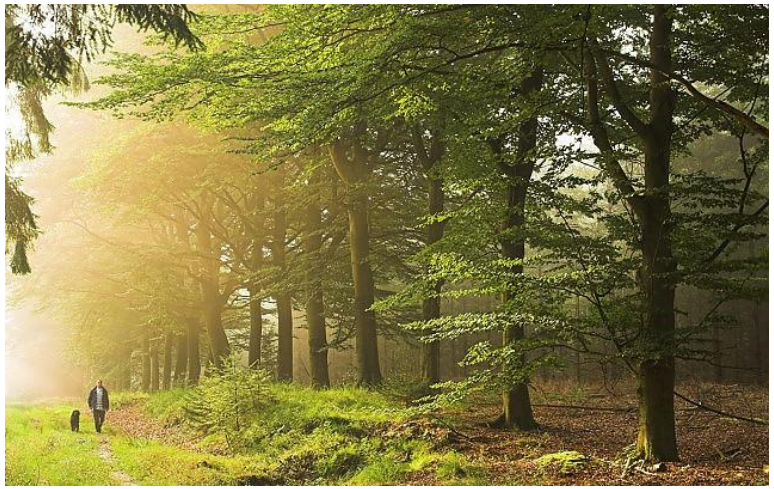
EU Units

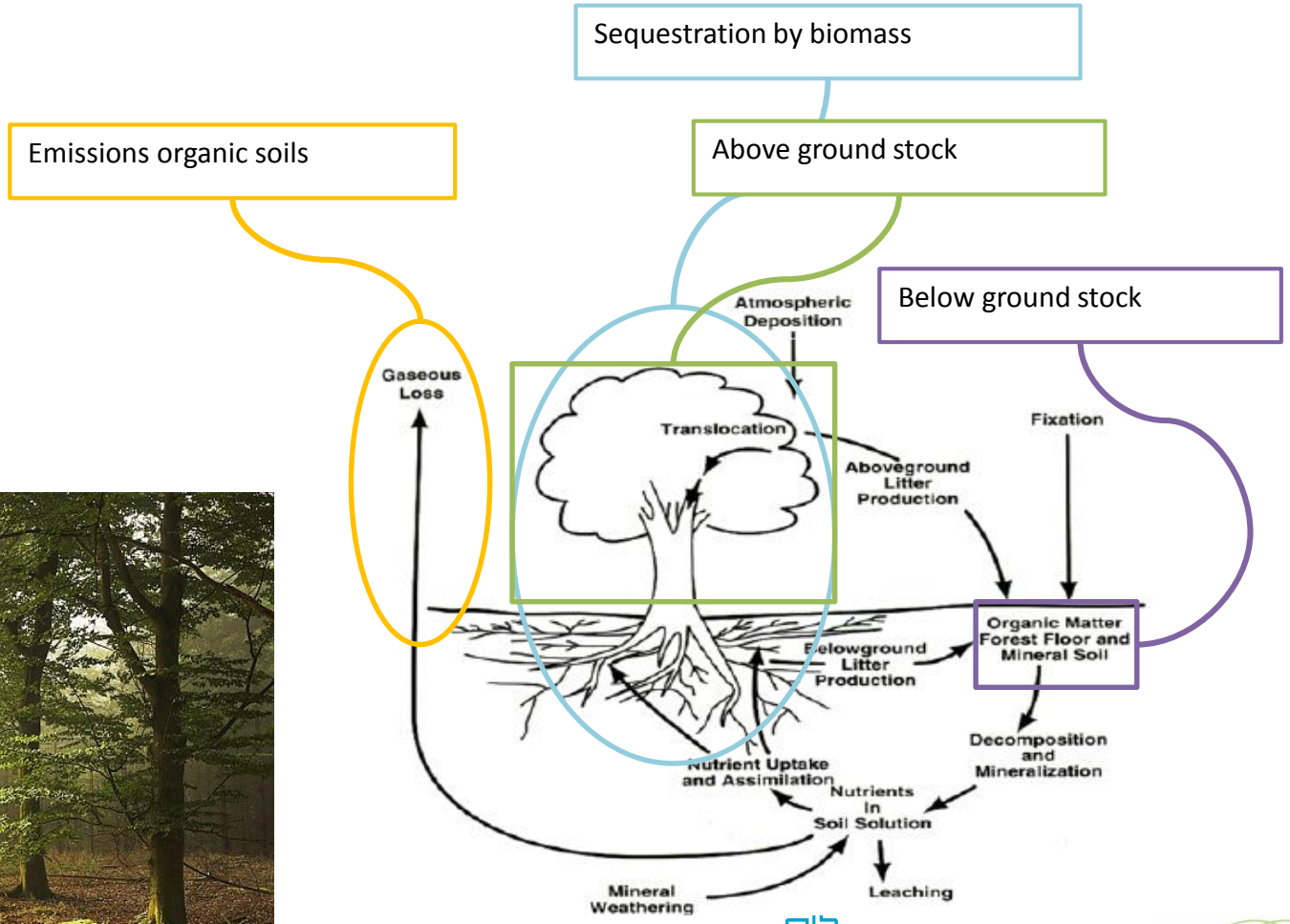
- <all other values>

LCEU

- Landbouw: eenjarige gewassen
- Landbouw: meerjarige gewassen
- Landbouw: kassen
- Landbouw: grasland voor veeteelt
- Landbouw: faunarand
- Landbouw: bebouwd
- Duinen met vaste begroeing
- Strand, droogvallend zand en actieve duinen
- Loofbos
- Naaldbos
- Gemengd bos
- Heide
- Zand
- Wetlands
- Grasland, geen weiland
- Openbaar groen
- Overig onverhard terrein
- Uiterwaarden
- Kwelders
- Woongebied
- Kantoren en bedrijven; industrie
- Kantoren en bedrijven; services
- Kantoren en bedrijven; overheid
- Wegen, parkeerterrein, overig verhard terrein
- kantoren en bedrijven; bosbouw
- Kantoren en bedrijven; visserij
- Kantoren en bedrijven; niet-commerciële dienstverlening
- Zee
- Meren, plassen, overig binnenwater
- Rivieren
- Onbekend

Biocarbon





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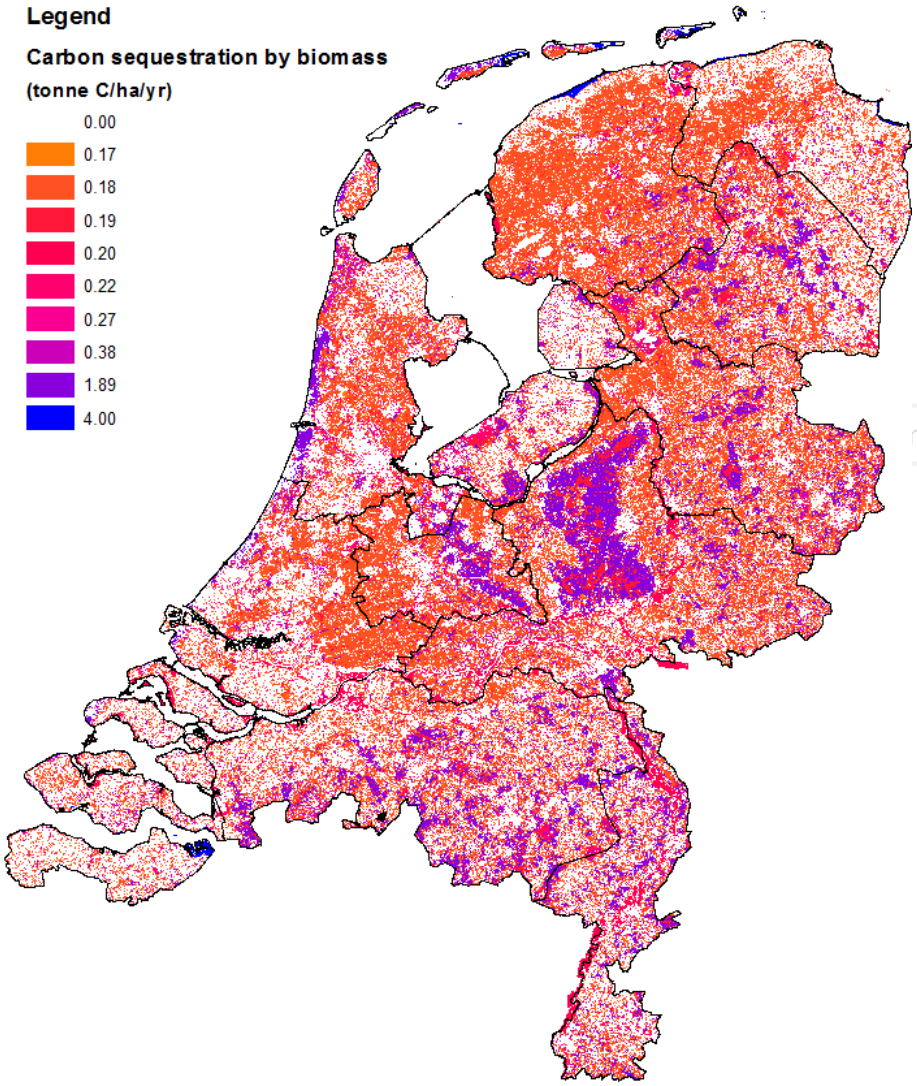
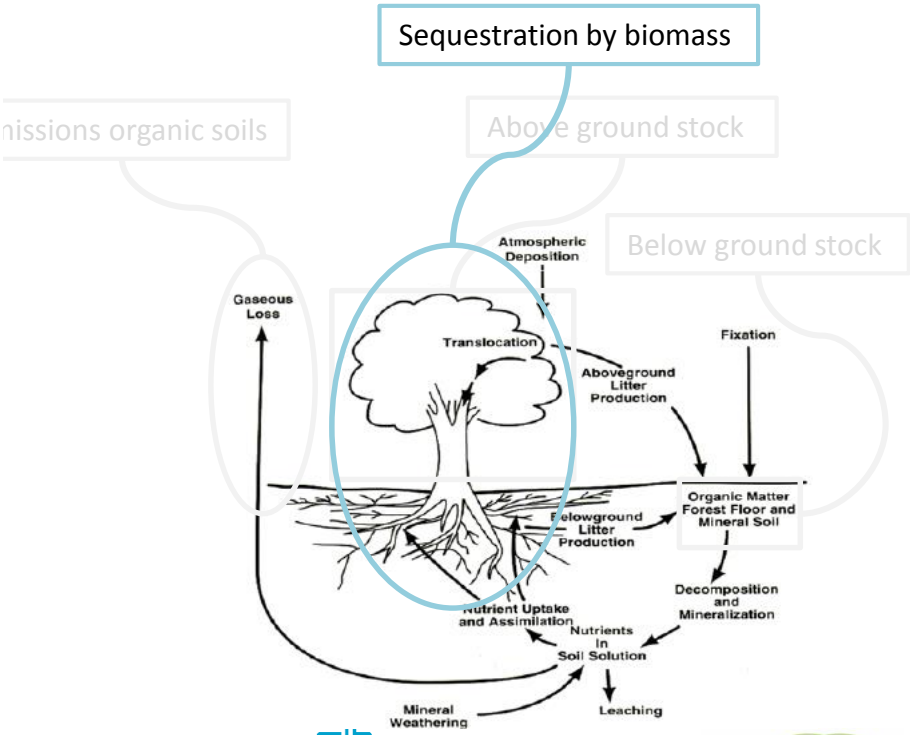
Carbon sequestration



- Forests have largest total contribution to sequestration
- Total sequestration: 0.98 Mtonne C jr^{-1}



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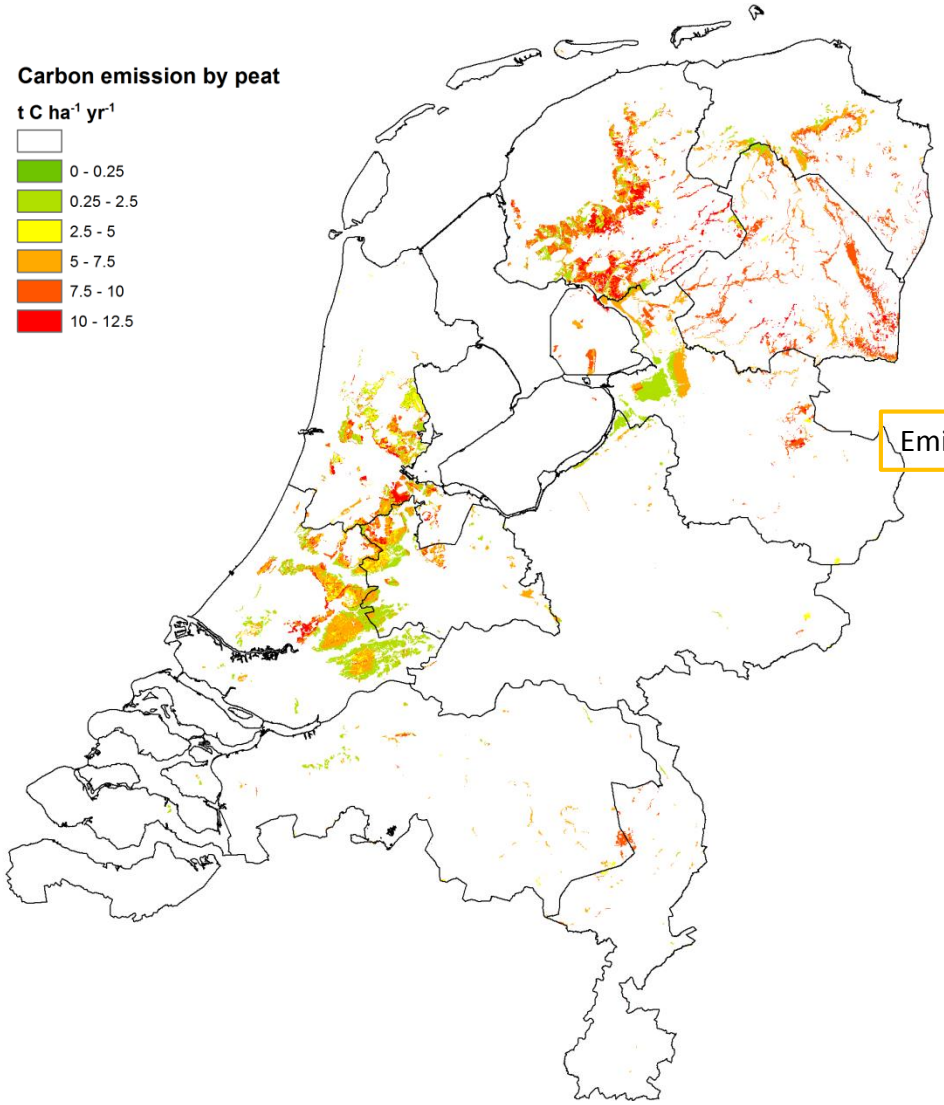
Emission organic soils



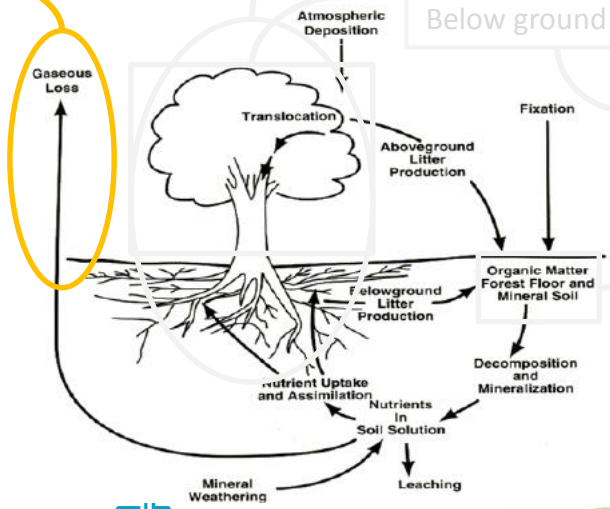
- Emission depends on ground water level
- Emissions peat soils: 1.4 Mtonne C yr^{-1}
- Emissions peaty soils: 0.4 Mtonne C yr^{-1}

Sequestration by biomass

Above ground stock

Below ground stock

Emissions organic soils



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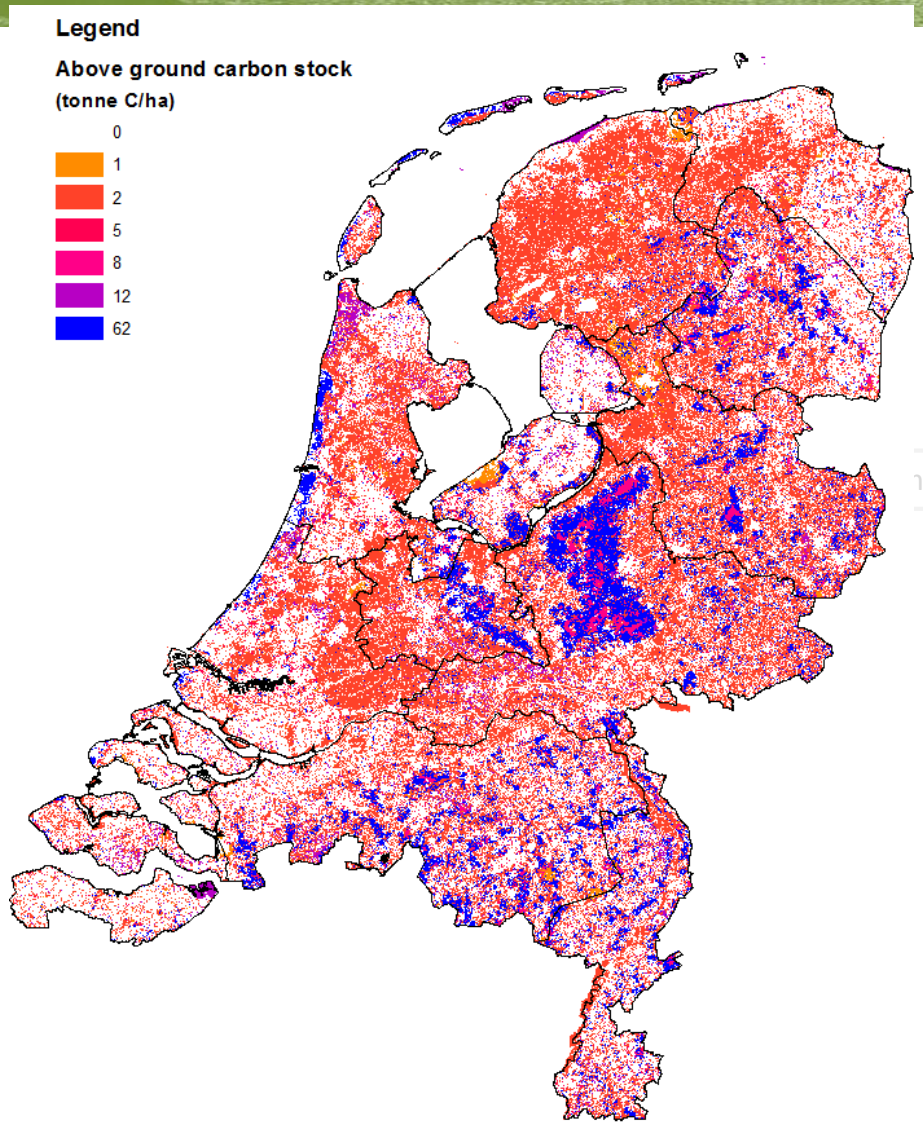
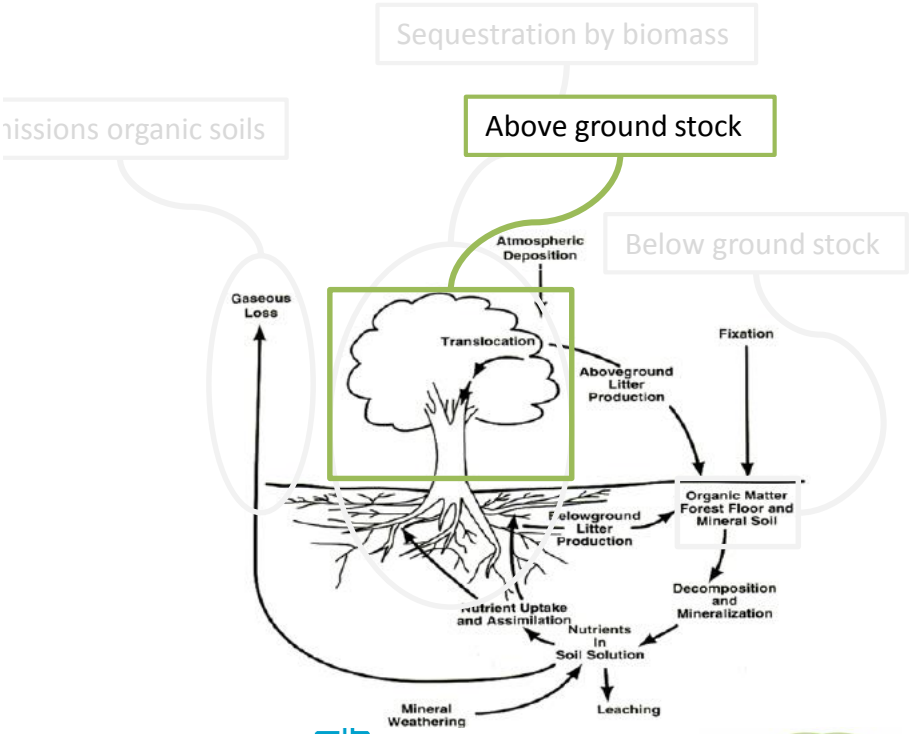
Carbon stock- above ground



- Largest carbon stock in forest
- Total stock: 25 Mtonne C



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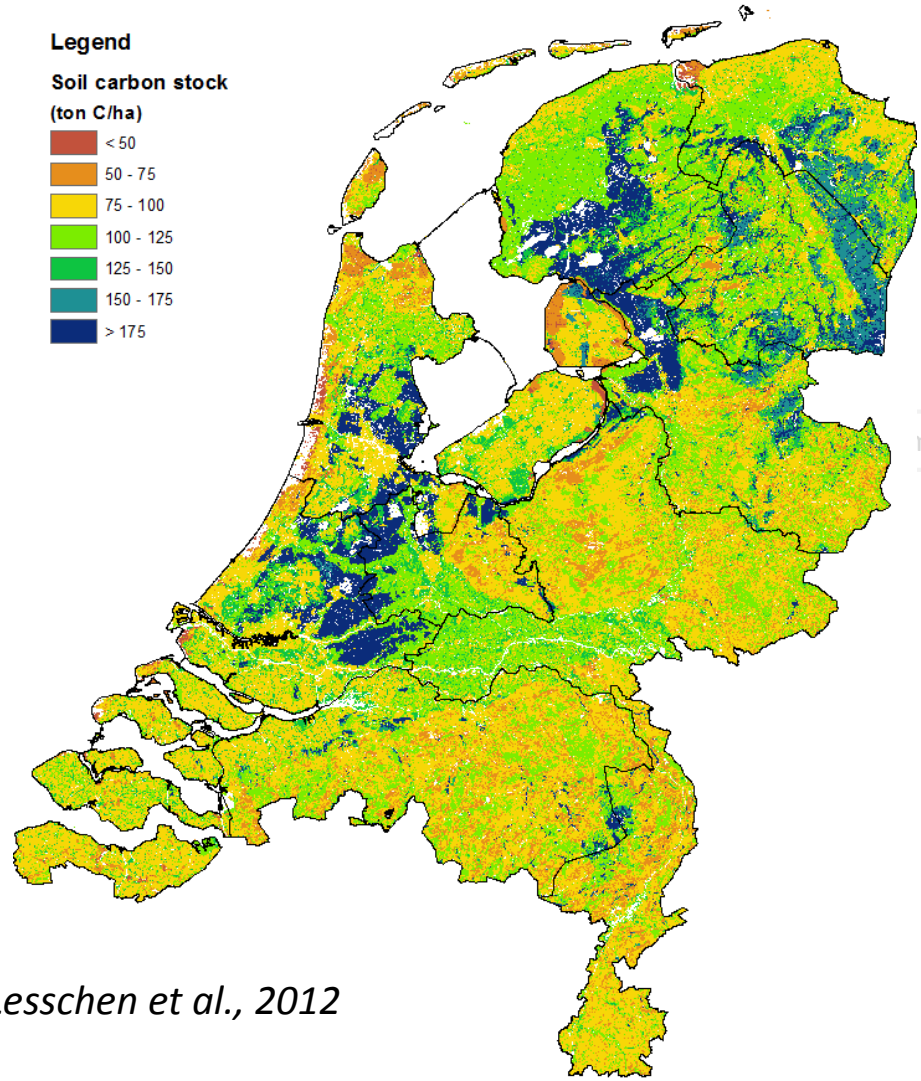
Carbon stock – top soil (30 cm)



Lesschen et al., 2012

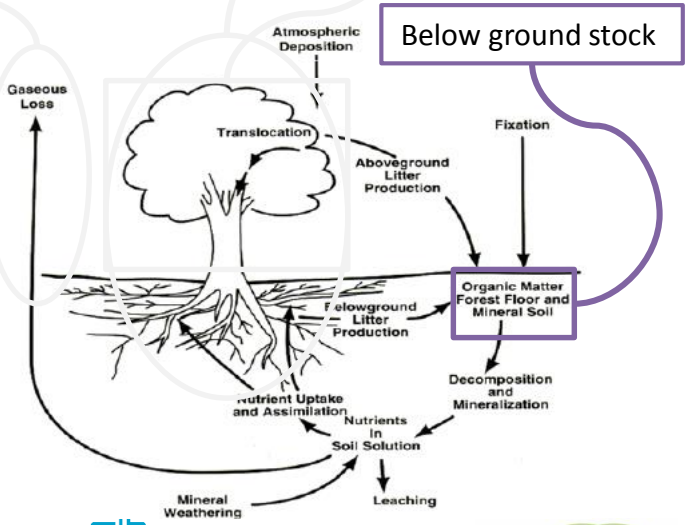
- Largest carbon stock in organic soils
- Total stock top soil: 357 Mtonne C

Sequestration by biomass

nissions organic soils

Above ground stock

Below ground stock



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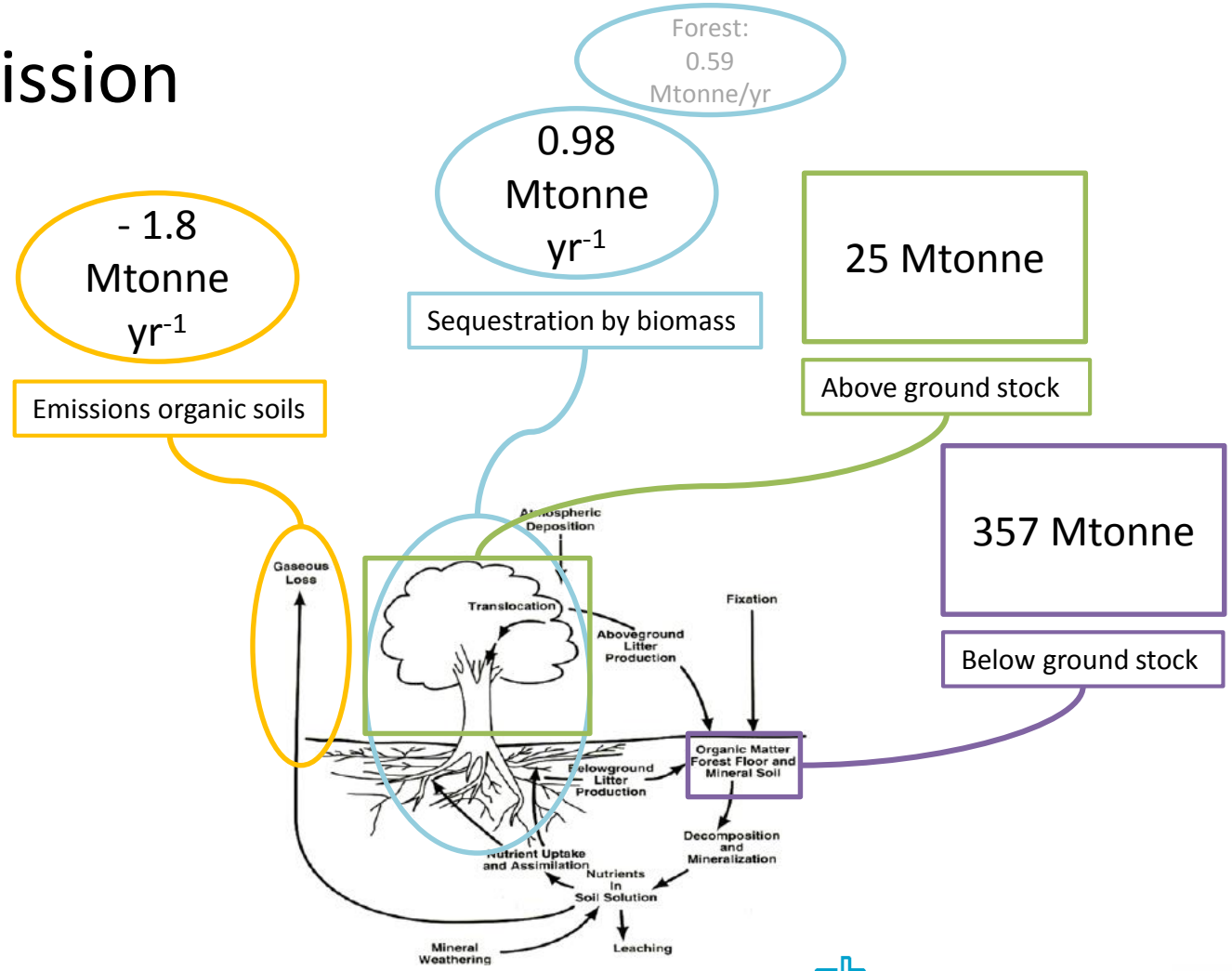
Biocarbon account

- Net emission



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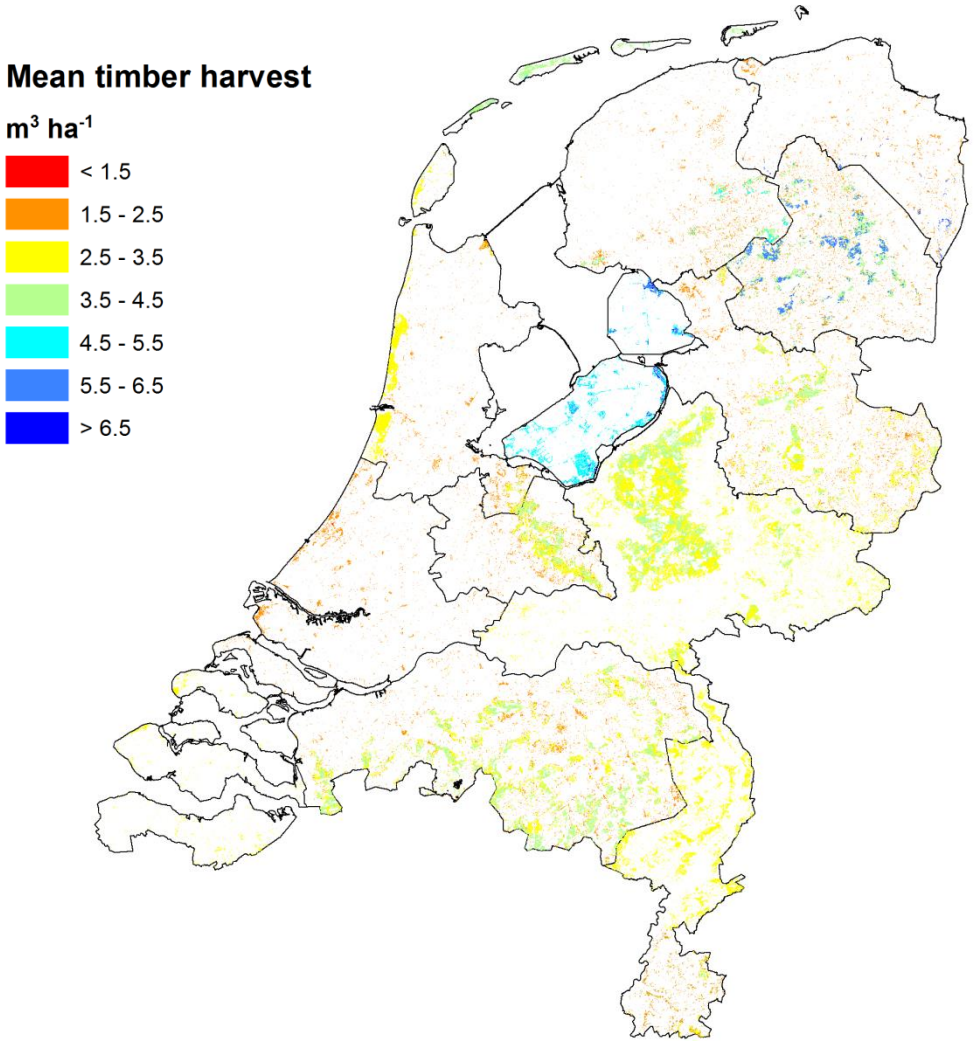
Timber production (harvest)



- Mean harvest: 3.4 $m^3\ yr^{-1}$
- Total harvest: 1.1 $10^6\ m^3\ yr^{-1}$

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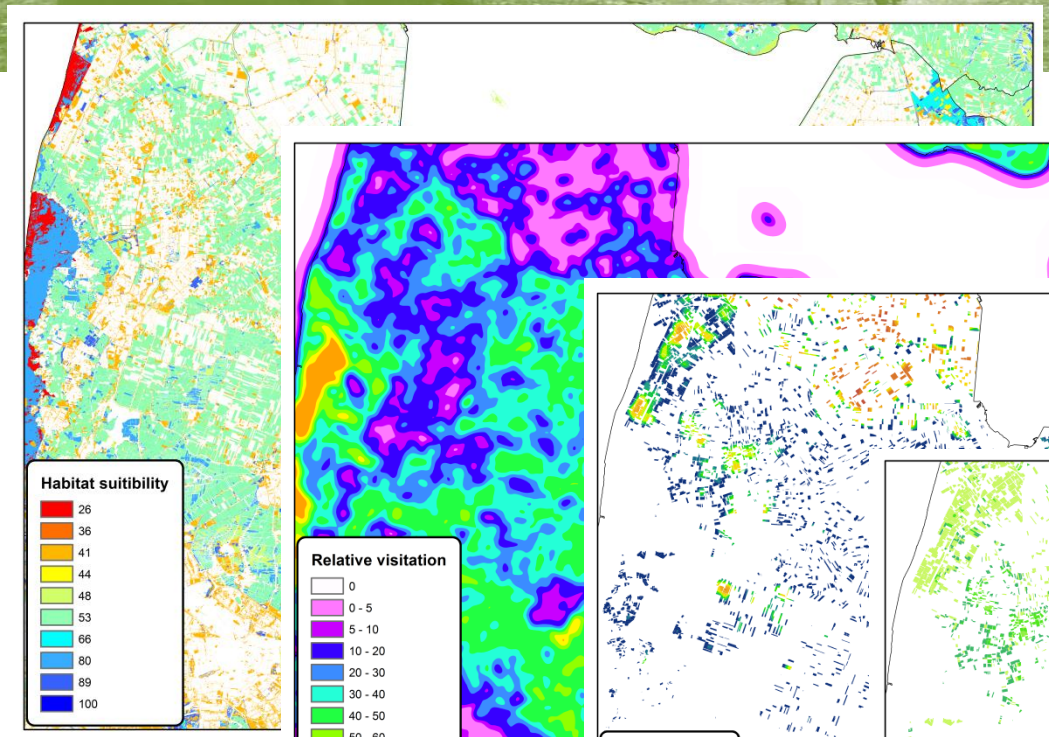
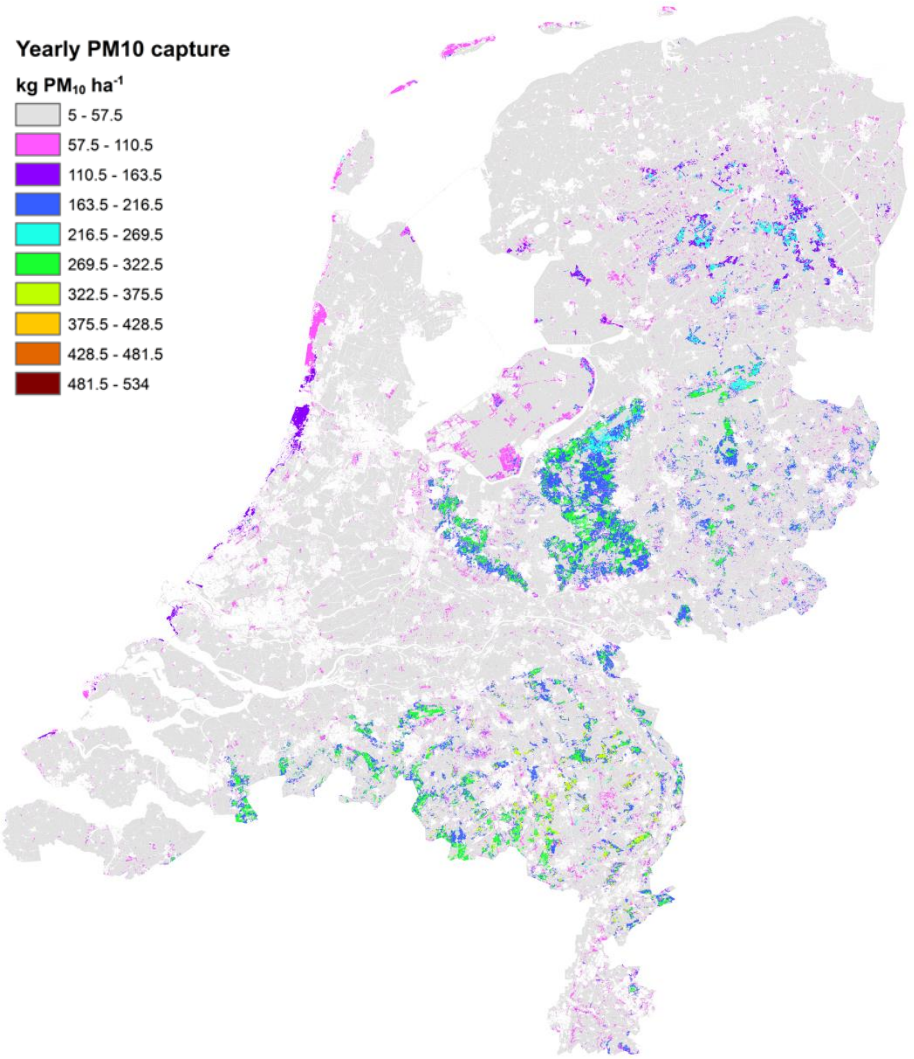
Pollination service (ongoing)



Solitary bees

- Input: map pollination dependent crops

PM_{10} capture



- Input: ambient PM_{10} concentration
- Largest contribution by coniferous trees
- Mean capture: 27 kg PM_{10} yr^{-1} ha^{-1}
- Total capture: 72,500 tonne PM_{10} yr^{-1}

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Planning NKR_NL

- 2017 Physical supply and use
- 2017 Condition account
- 2018 Monetary supply and use
- 2018 Capacity account

Part 2

Using earth observation data in the Netherlands

- Ongoing and future work –

Ongoing (on the basis of digitized areal photographs)

- analysing paved surfaces in urban zones (with RS) and combining these with infiltration model to assess pressure on sewage systems during high rainfall events
- Identification of vegetation structure including low and tall trees (by RIVM)

Using satellite data for ES

Future work (proposed)

- Measure standing tree biomass, including in small landscape elements
  - Improve current estimates
  - Variation within land use classes
- Temporal analysis of NPP in grasslands (working with Wageningen UR) to monitor grass growth in pastures
- Based on existing SarVision models: Crop yield forecasting / monitoring (draft models available for temperate crops)

Conclusions

- In the NLs: remote sensing observation with 30 cm resolution is available once per year and is – in combination with the detailed spatial maps that are available e.g. from the cadastre - sufficient for many applications required for accounting
- However in the NLs new applications are being developed and tested that relate to yield modelling (in forests, crops and pastures): collaboration and further funding is needed !

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