



# Second conference on Earth Observation for Monitoring, Reporting and Verification of Carbon Removals

7–10 October 2025 | Copenhagen, Denmark

# Breakout groups

13:30-15:00

## **BOG 1 - Agriculture and agroforestry on mineral soils**

*Co-Leads: Eric Ceschia (CESBIO/INRAE) and Emanuele Lugato (JRC)*

Coffee break

## **BOG 2 - Planting of trees**

*Co-Leads: Eric Arets (Wageningen University & Research) and Joanne Nightingale (NPL)*

15:30-17:00

## **BOG 3 - Rewetting of Peatlands**

*Co-Leads: Parvez Rana (LUKE) and Lucia Causey-Hugecova (DG CLIMA)*



# Breakout Group 1 - Agriculture and agroforestry on mineral soils

Chairs: Eric Ceschia (CESBIO/INRAE) and Emanuele Lugato (JRC)

## Questions to be addressed:

- Use and limits of remote sensing to map management changes and in particular carbon farming activities (e.g. cover crops, straw management, organic amendments)
- Accuracy and feasibility of remote sensing approaches in directly quantifying soil and vegetation (i.e. biomass) C pools and their changes in time;
- Assimilation of remote sensing products (e.g. LAI, proxies of biomass) into process-based crop models to better quantify biomass and subsequent C inputs to the soil for SOC modelling
- Data needs to improve remote sensing-based approaches, including benchmark sites, monitoring networks (e.g. ICOS, JECAM, national soil monitoring networks, living labs), ISO procedures, community of best practices;
- Applicability of remote sensing to stratify the areas under conventional/carbon farming and/or define “similar circumstance” to produce a standardized baselines (optional)

# Breakout Group 1 - Agriculture and agroforestry on mineral soils

**Use and limits of remote sensing to map management changes and in particular carbon farming activities (e.g. cover crops, straw management, organic amendments)**

- RS is definitely seen as a tool allowing the monitoring of some carbon farming activities but some can not be quantified (straw export, organic amendments)
- Need to connect 'carbon community' with AMS developed for CAP
  - Although farms not covered by LPIS could have an interest in carbon farming activities
  - Not all relevant practices to carbon monitoring are included

Call for action: organise a joint workshop with CAP community

# Breakout Group 1 - Agriculture and agroforestry on mineral soils

**Accuracy and feasibility of remote sensing approaches in directly quantifying soil and vegetation (i.e. biomass) C pools and their changes in time;**

- Converge towards a consensus: it is not possible to directly estimate SOC Stock and even more stock changes using RS. --> this is a progress compared to some years ago
- For Above Ground Biomass, EO has to play a key role in quantifying crop/cover crop biomass and has a great potential for quantifying tree biomass in agroforestry systems (isolated trees/rows); can we learn from the replanting of trees?
- Next steps: agree on basis requirements for RS products (and alignment with models whose requirements may differ)

# Breakout Group 1 - Agriculture and agroforestry on mineral soils

**Assimilation of remote sensing products (e.g. LAI, proxies of biomass) into process-based crop models to better quantify biomass and subsequent C inputs to the soil for SOC modelling**

- Game changer => increase accuracy, objectivity, reduce uncertainty, reduces cost and increase operationality because less activity data required and implicit accounting for pest/extreme event/ and management effects
- Intercomparison community initiatives (MME) needed
- Call for action: gapfilled times series of LAI/biomass time series with S!

# Breakout Group 1 - Agriculture and agroforestry on mineral soils

**Data needs to improve remote sensing-based approaches, including benchmark sites, monitoring networks (e.g. ICOS, JECAM, national soil monitoring networks, living labs), ISO procedures, community of best practices;**

- A lot of emphasis on this point during discussions
- Identified data gaps:
  - Agroforestry: mapping of isolated trees. Can we supplement this with proximate sensing (i.e phone picture) ?
  - Need for in situ data for CAL/VAL of allometric relationships
  - Need to combine several observation networks (flux sites, soil monitoring networks, JECAM, observatories) add collection of some critical info on some monitoring networks like activity data and biomass on soil monitoring network
  - Data collection should not only include C fluxes measurements, but also activity data, micronutrients, nitrogen, ..  
-> Alignment with other policies

# Breakout Group 2 - Planting of Trees

Chairs: Eric Arets (Wageningen University & Research) and Joanne Nightingale (NPL)

## Session 1: Overview of CRCF Tree Planting Requirements and Existing Methods

1: CRCF Tree Planting Overview and Requirements for MRV; **Eric Arets**

2: Satellite-based carbon removal estimates in regrowing forest: Examples from the tropics ; **Viola Heinrich**

## Session 2: Monitoring Tree Planting in the EU context

1: EO in support of quantifying Tree Planting - Lessons learnt from the ESA FCM project; **Jukka Miettinen**

2: EU-FOCIS – Forest Observations for Carbon Market Integrity using Sentinels; **Joanne Nightingale**

## Goal:

Discuss current state of the art of satellite capabilities for **estimating** and **monitoring** carbon sequestration through tree planting activities in Europe: \*Gaps \* Requirements \* Ancillary Data

## Participants:



Academia; Research; Commercial / Project Developers; Data providers; Land-Owners



NGO; Ratings Agencies; Existing Standards bodies

Thanks!

# BOG 2 – EO for tree planting MRV



## CRCF Methodology

- What is its purpose compared to existing standards?
- “Standard for standards”



## Methodology Flexibility

- Push for frameworks to remain adaptive across project lifetimes to deal with technological advancements
- Consistent baselines data collection desired across methodologies.



## Ground Data and Allometry

- Consensus for more ground referencing (ALS, TLS, NFI).
- Need CRCF-specific allometry beyond monocultures.



## Uncertainty Management

- Define target uncertainty levels to guide data requirements and ensure consistency for credit buyers.
- No methodology captures planting to >~5 years of age
- Need incentives for landowners to manage land.



## Remote Sensing Requirements

- Preference for consistent, long-term, open-source datasets.
- Push for higher spatial resolution
- Continued ALS national level data capture.



## Improved Cross Sector Collaboration

- Call for stronger cooperation between academia, private sector, and landowners.
- Starting to happen via Horizon etc.
- Transparency and trust are essential.
- CRCF Knowledge Exchange Group?

## Breakout Group 2 - Planting of Trees – Key Messages

---

No “one data source nor method” is the solution

Need a combination of Satellites, Airborne, Ground and Models

- Need for **transparency** (i.e. avoid over exaggerating capabilities)
- Documentation
- Provision of uncertainties (for comparison)

# Breakout Group 3 – Rewetting of peatlands

**Chairs:** Parvez Rana (LUKE) and Lucia Causey-Hugecova (DG CLIMA)

**Presentation 1:** CRCF Peatland rewetting methodology and requirements for MRV; Lucia Causey-Hugecova

**Presentation 2:** Standardizing MRV for Peatland Restoration Projects: Status-quo and future prospects; Svenja Wähling (AECO)

**Presentation 3:** Remote sensing-based monitoring of wetlands and their restoration, Parvez Rana (LUKE)

- **Scalability and Cost-Effectiveness:** How can remote sensing technologies be leveraged to monitor peatlands efficiently in terms of helping to improve currently used proxies (such as water level and vegetation)?
- **Integration with Traditional Methods:** What are the best practices for combining remote sensing data with traditional field-based monitoring methods to validate findings and ensure comprehensive coverage of carbon and biodiversity?
- **Data Resolution and Frequency:** What resolution (spatial and temporal) of remote sensing data is required to effectively monitor changes in peatland hydrology, vegetation, and biodiversity, and how can we balance the need for high-resolution data with the practicalities of data acquisition and analysis?
- **Innovative Technologies:** How can emerging remote sensing technologies, such as drones equipped with multispectral and thermal sensors, contribute to the monitoring of peatland rewetting projects, especially in terms of providing high-resolution data for specific sites?
- **Standardization and Comparison:** What standards or protocols should be established for remote sensing data collection and analysis to ensure that data can be compared and aggregated for broader insights into peatland rewetting outcomes?
- **Real-Time Monitoring and Adaptive Management:** Can remote sensing technologies facilitate real-time or near-real-time monitoring of peatland conditions, and if so, how can this capability be used to support adaptive management practices such as paludiculture?



European  
Environment  
Agency



THE EUROPEAN SPACE AGENCY

