Where are we now?

Where do we want to be?

How to get there?

Carbon Farming Summit

Contribution of satellite-derived data to MRV for Carbon Removals

enhancing monitoring and credibility
integration and strategic solutions
overcoming barriers
stakeholder´s engagement

Monica Miguel-Lago

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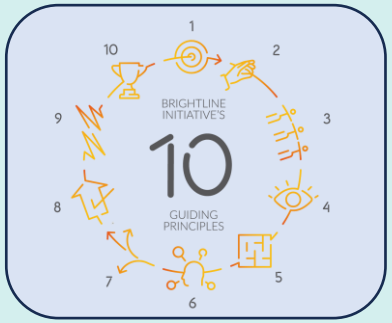
The contribution of satellite-derived data to MRV for Carbon Removals

Where are we now?



How to get there?

Expertise in regulatory compliance, global carbon assessment, carbon farming methodologies, stakeholder engagement, ecosystem analysis…

Where do we want to be?

Earth observation (EO) contributes significantly to the EU's journey to climate neutrality by 2050.

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Where are we now?

What is the challenge?

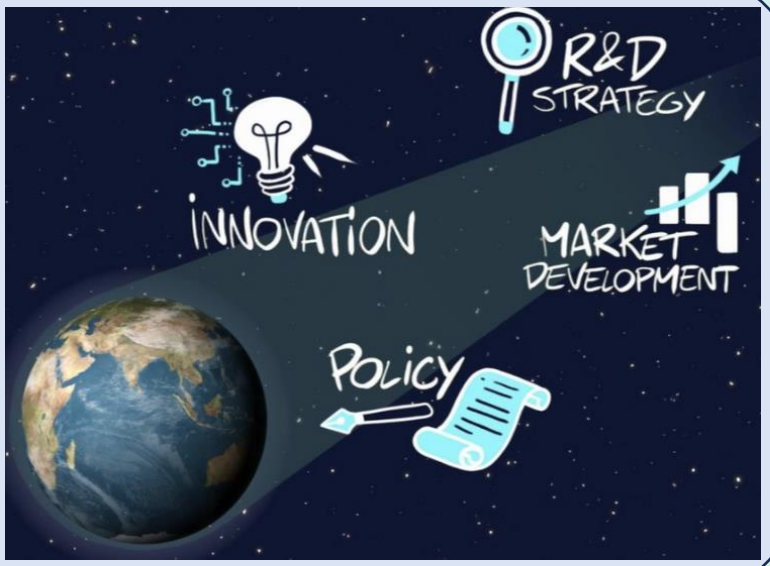
The current state-of-play in the agroforestry sector and the maturity of EO contribution to addressing the challenges of the sector

Benefits

- discussion about unified accounting system for MRV
- increase carbon sequestration
- more biodiversity and nature
- increased climate resilience of farm and forest land
- new business opportunities, additional income for land-owners
- cost efficient monitoring
- innovation methods
- ....

Challenges

- credible accounting, quality standards and harmonization
- build trust
- interest for carbon credit markets
- access financing & funding for implementing cost
- advisory services to manage risk
- integrating with other technologies for better processing and interpretation of data
- ...



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Where are we now?

What is the challenge?

Data Management & Technical	Integration, Verification & Regulatory	User Uptake
-Data access & infrastructure (**availability in situ inventories for cal/val**)	**Integration** diverse datasets and robust models and methodology comparison	-Recognition & coordination challenges (**flexibility & inclusivity, scalability**)
-Resolution / scale of data (spatial, temporal) and accuracy of data in complex ecosystems	-Robust **measurement**, **standardization** and **quality** assurance	-**Collaboration** across sectors
-**Adaptation to diverse contexts** with multiple data entry (i.e diverse pedoclimatic, forestry, agropastoral…)	-Demonstrate additionality, accounting & verification	-Digital **adoption** and operational engagement
-Defining **uncertainties and harmonizing** EO products	-Managing **scalability**, cost to address carbon footprints	…
-Reflectance challenges in remote sensing..	-Methodology recognition & legacy data systems	
	-**Performance based & certification frameworks** (i.e, carbon removal certification framework (CRCF), LULUCF…	

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How to get there?

How will be managed?

Potential benefits of satellite derived-information for monitoring soil carbon stocks in the EU

WHY	• Increase **adoption** of EO solutions for established Carbon Farming initiatives • Improve **scientific and technical solutions** feeding into Carbon Farming aspects (e.g. EO-based approaches for MRV)
HOW	• **Comprehensive evaluation of current practices**, operational issues and technological developments within carbon farming • Identification of **EO providers** who exhibit a strong case of **upscaling** • Select **actions** to be taken by the community of practitioners to achieve carbon removals
WHO	EU institutions, MS, Regional & Local Authorities, Land owners, EO services providers, Research & Academia

STREAMLINE THE USE EO FOR CARBON FARMING & EMPOWER USERS TO MAKE THE MOST OF EO-BASED SOLUTIONS

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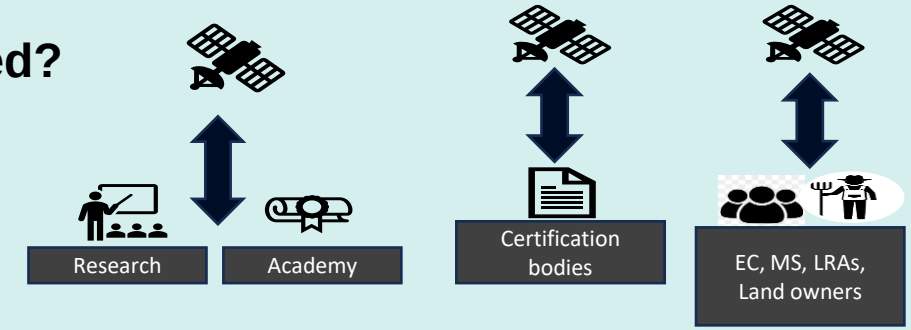

Monitoring
Understand the setting, detecting, measuring (data collection)

Reporting
Design, analysis & quantify the measurements in transparent models (insights & predictive analysis)

Verification
Evaluating the data & actionable metrics to comply with requirements (credible, trusted, confirm the accuracy)

Assure **transparency** and strengthening (supply chains)	**Uptake of EO in the initiatives** related to Carbon removals	**Strenthening the capacity** of the demand side	**Upscaling** of EO uptake inside countries and PAN EU	**Adoption of EO** supporting Carbon Removals
-EO data provides regular and repeatable **measurements** -Multi-annual time series of observations	-Support political and financial guidance	**-Models** are not yet fully mature > Integrate EO derived information into models	-Turn pixels into information at different scale along time -Taking into account different climates, landscapes, etc	-Demonstrate information reliability and level of confidence

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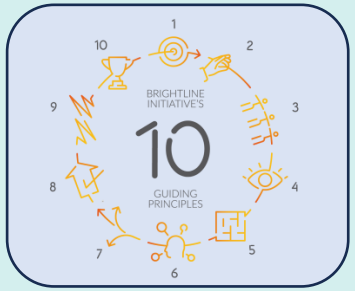
Where do we want to be?

What results we expect?

Integrate benefits of satellite derived-information for monitoring soil carbon stocks in the EU



EU Green Deal — **Earth Observation for MRV (Carbon removals)**

1. Vision *(How we define success)*

Earth observation (EO) contributes significantly to the EU's journey to climate neutrality by 2050.

EO satellites provide data on land use, vegetation health, and soil carbon levels, aiding decision-making for carbon removal strategies like afforestation and sustainable land management.

Integration with carbon accounting systems aids progress assessments, making EO pivotal for optimizing removal practices, promoting sustainable land management, driving carbon sequestration innovation and supporting the Monitoring, Reporting and Verification (MRV) of EU carbon removals regulations.

Guiding Principles

- Policies: Farm to Fork Strategy, Biodiversity Strategy, LULUCF, CRCF, Common Agricultural Policy, Emissions Trading System, Circular Economy Plans
- Key words: EO, MRV, carbon removal, carbon stock, LULUC, SOC, quantity & quality of land, accuracy, precision, accountability, vegetation health, biomass estimation, emission reduction, sustainable economy, integration, etc.

Goals and Outcomes

- Enhance Land Management for Carbon Optimization and Ecosystem Resilience > EO data to inform restoration efforts, adaptive management strategies, land management practices, optimizing carbon sequestration potential and enhancing ecosystem resilience.
- Safeguard and Maximize Carbon Sequestration Potential of EU's Agroforestry Lands > Leverage EO data to evaluate, expand, and sustainably manage agroforestry lands for enhanced carbon removal and storage.

2. Value Proposition *(The value delivered to stakeholders)*

- **EC:** Better understanding on how EO can help support MRV and to meet the Green Deal agenda objectives. Views of practices from member states progress to subscribe the regulation.
- **Local-National Gov't:** Member States better decision making. EO contributes with features that are essential for policy development, implementation, and measure tracking.
- **Business** (Individual and Communities of Practice – Land owners): EO data & services will help on the land management (farming, protecting, restoring, etc ading value to the value chains).
- **Academia/NGOs:** EO complements datasets and methodologies providing value to understand the carbon and biodiversity policies.

3. Strategy *(How we achieve success)*

Operational

- Support the integration of EO data to inform and optimize decision-making processes, enhancing carbon sequestration efforts and ecosystem resilience through informed management practices.
- Compile best practises to support awareness (MS & land owners) on land use changes and their impact on carbon stocks which inform adaptive management strategies and ensure effective carbon sequestration.
- Deep dive discussions in areas with restoration needs to enhance carbon removal and storage capacities while improving ecosystem resilience.

Outcomes

- EO data into decision-making improves land management, enabling informed choices prioritizing carbon sequestration and ecosystem resilience for sustainable practices and the long-term health of Europe's ecosystems.
- Cases refine adaptive management, enabling tailored strategies to maximize carbon removal & storage and ensuring targeted efforts.
- In-depth discussions optimize effort and strategically invest resources for maximum impact on carbon removal goals.

Processes

- Alignment with Sustainable agenda discussions
- EU Policy development and policy implementation
- Harmonization and validation and verification
- Standardization and certification
- Measure tracking and integration of datasets
- Decision making & better governance
- Integrate financial mechanism and geospatial data to monitor impact

Outcomes

- Alignment with SDGs 2, (7) , 11, (12), 13, (14), 15
- Common approach to EU wide integrated monitoring framework
- Accurate, reliable repository of data, ensuring consistency and credibility
- Increased trust, reliability, and interoperability among stakeholders
- Facilitate real-time monitoring, evaluation, optimization of strategies
- Informed policies, targeted interventions, optimized resource allocation
- Ensure optimized allocation of resources

Engagement Offering & EO Capacity

- Increase awareness of EO capabilities for agro-forestry and access to datasets, fostering skill enhancement and competency development, aligning with the digital agenda's objectives.
- Encompasses the provision of high-revisit frequency, wide-area coverage with precision, facilitating cost-efficient operations and scalable automated analyses.
- Introduce management exercises to achieve for example PPP structures

Outcomes

- Enhances support for agro-forestry monitoring efforts.
- Offer potential for efficient, cost-effective, and accurate certification.
- Promote transparency and accountability.
- Foster collaboration and consensus-building.
- Facilitate knowledge transfer to commercial datasets

4. Strategic Initiatives *(Our plan of action)*

Policy/ Technology Initiatives — Organizational Initiatives

1 — Invest in the Foundation

- Formation of Focus Groups
- Monthly Meetings
- Discovery Summits
- Workshop to define top 10 KPI's

2 — Build Capability

- Policy: contribute to the EU LULUCF and CRCF discussions (Expert Groups)
- Research & Development: methods
- Awareness & Capacity Building: demonstrator & case stories
- Infrastructure and Technology: data collection, processing, and dissemination

3 — Transform

- Organizational change: adapt the strategic vision and follow the policy trains
- Evolve stakeholder´s consultation outcomes (local, regional)
- Innovation insights for stakeholders: from challenges to opportunities

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