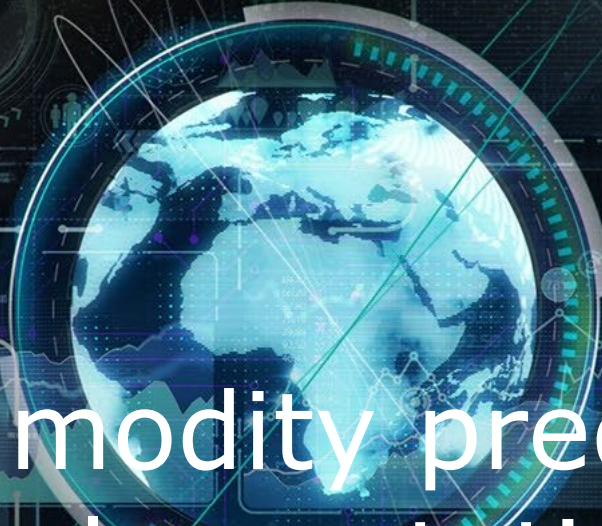


StatEO

5-7 May 2026 | ESA-ESRIN | Frascati (Rome), Italy

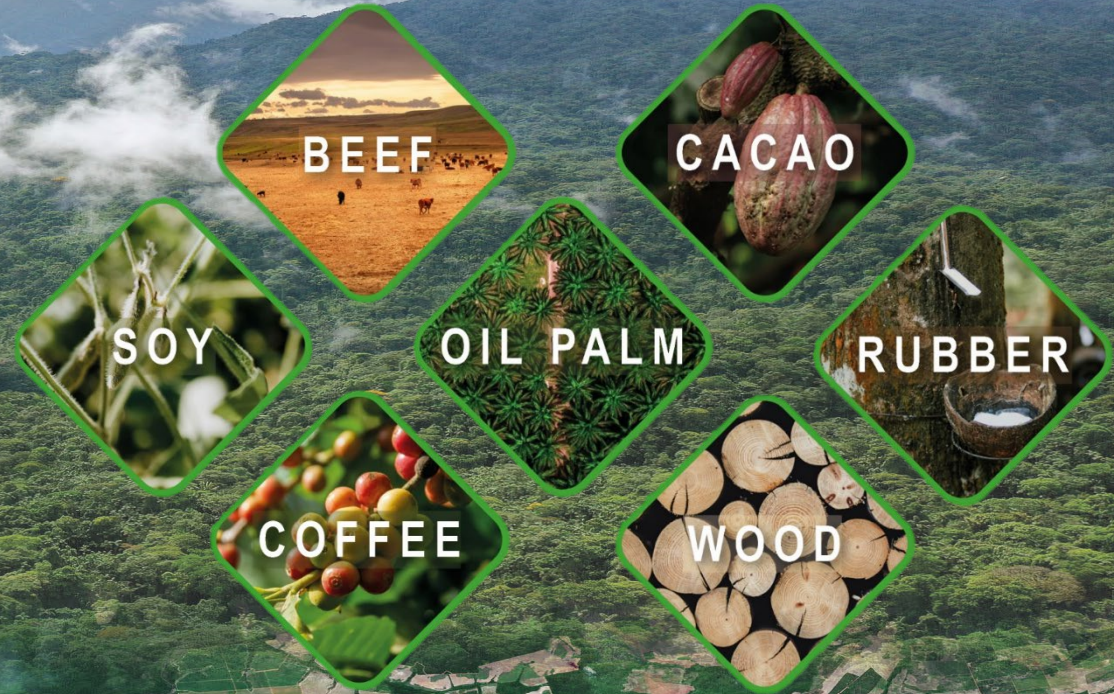


Validation of commodity prediction models to support the implementation of EUDR by EU Member states



Eric van Valkengoed (TerraSphere); Frederick Numbisi (GAF)
Menno de Vries (TerraSphere); Christophe Sannier (GAF)

ESA World Agro Commodities



Implemented by:

Lead: 
an e-GEOS (ASI / Telespazio) Company

Partners: 

 **WAGENINGEN**
UNIVERSITY & RESEARCH


Helmholtz Centre
POTS DAM

TerraSphere 



e-geos
AN ASI/TELESPAZIO COMPANY

ESA World Agro Commodities (2024 – 2026)



-Development of a pre-operational **monitoring system** to support the implementation of the EUDR by EU Member States based on classification of **Sentinel-2** data.

-Assess the **absence of deforestation** post 2020 and the **presence of the commodity** declared as part of the Due Diligence Statements submitted to the EU Information System by Operators and Traders.

-Satellite classification: the **Attention U-Net model** demonstrated superior predictive performance (as measured by the F1-score) for six commodities (Cocoa, Coffee, Oil Palm, Rubber, Soy, Beef).

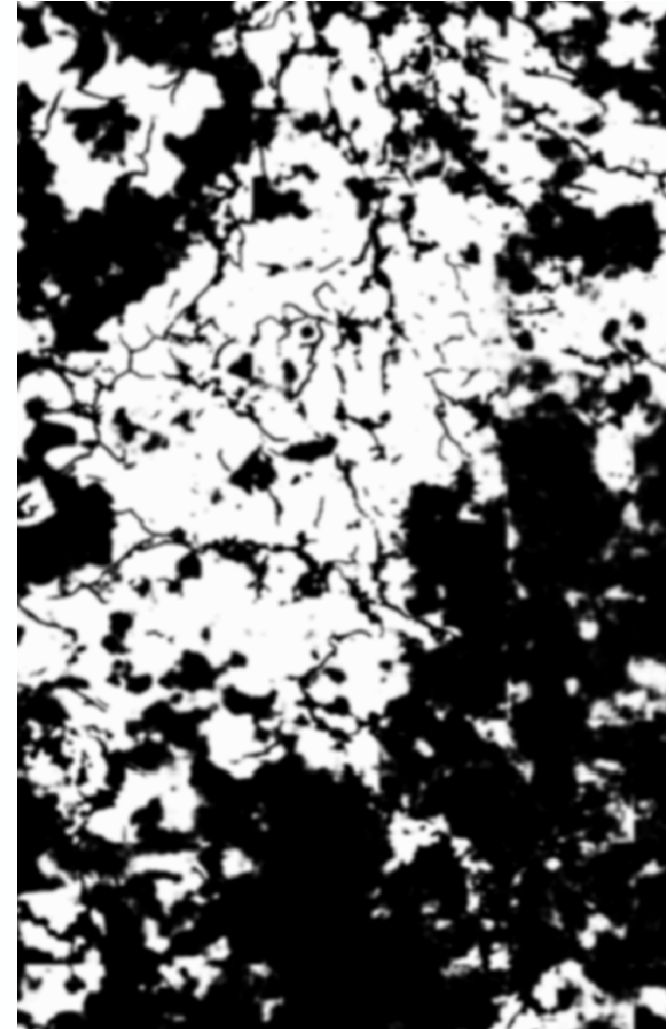
-The **quantitative validation** approach is based on visual interpretation from VHR imagery calibrated with locally available field observations and a systematic point sampling approach for a number of demonstration sites

across the world



Products to Validate

- Commodities: beef, cocoa, coffee, oil palm, rubber, soy
- Deforestation detection
- Product format: raster (GeoTIFF)
- Output types:
 - Binary crop (forest) maps
 - Probability maps
 - Multi-class maps
- Sites selected with Competent National Authorities



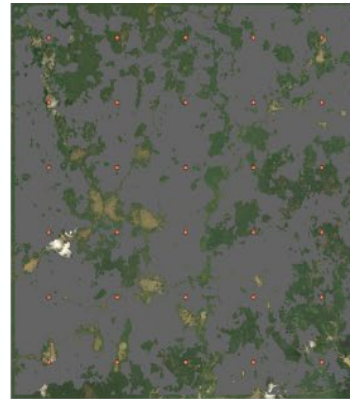
- Reference Data: in-situ data (e.g. COP4GEOGLAM)
- Ancillary Data: global and regional crop/forest datasets
- Visual Inspection: VHR, Sentinel-2 (1m super-resolution), Google Earth Pro (time aspect for deforestation detection)
- Goal: Ensure completeness, consistency, and accuracy



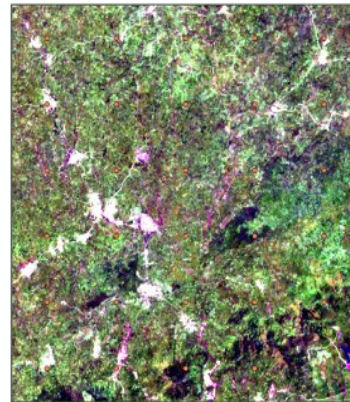
Validation Approach

- Quantitative:
 - User Accuracy (UA, Precision)
 - Producer Accuracy (PA, Recall)
 - Overall Accuracy (OA)
- Qualitative:
 - Map consistency
 - Visual alignment
 - Boundary accuracy

30 Regular Grid points sampling



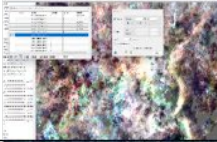
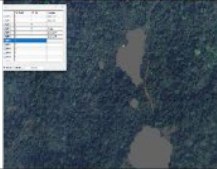
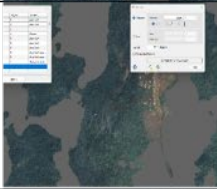

HR Sentinel-2 annual mosaic (2024)



In-Situ Reference Data

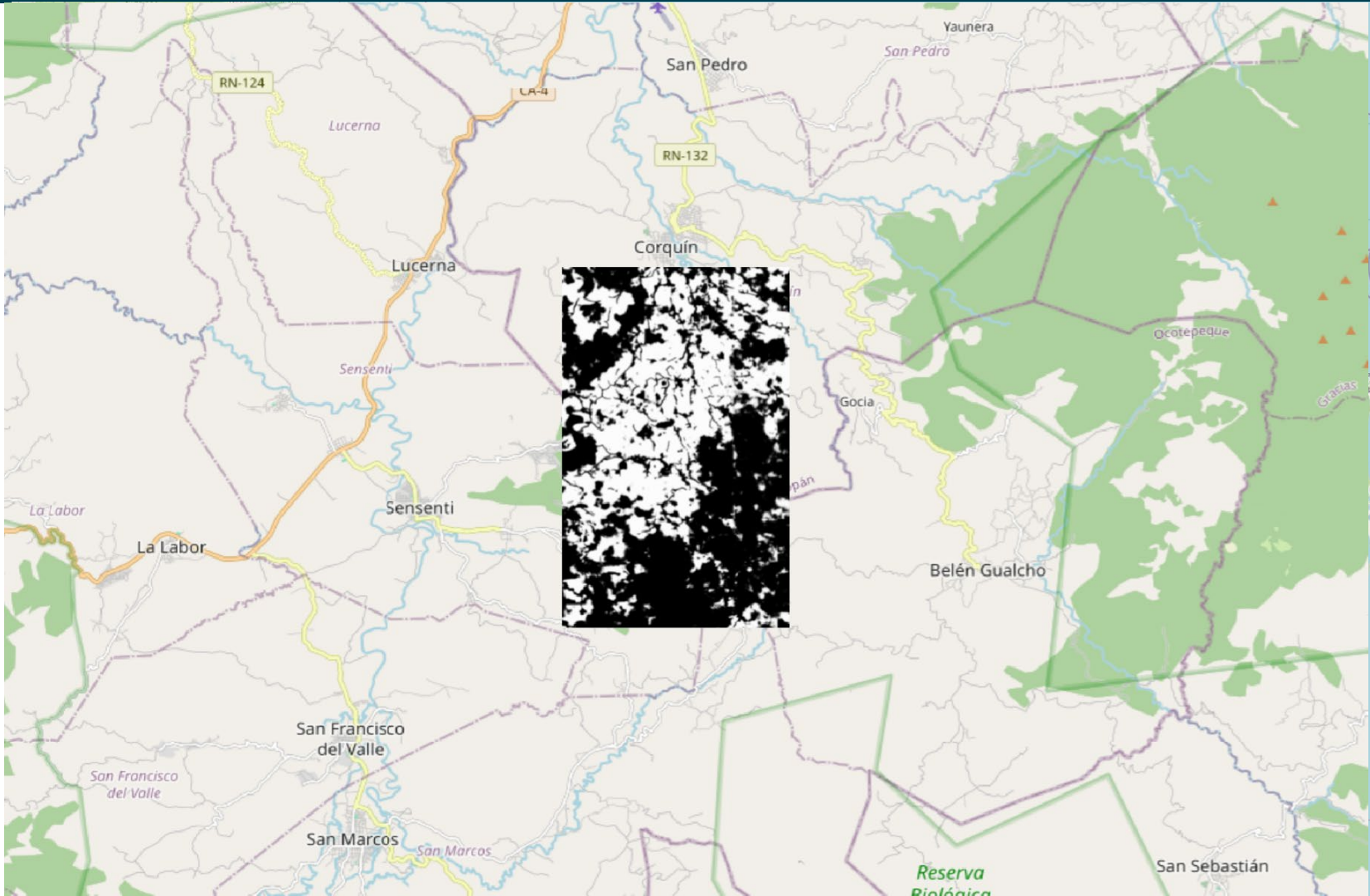


HR Google Earth Time-lapse imagery

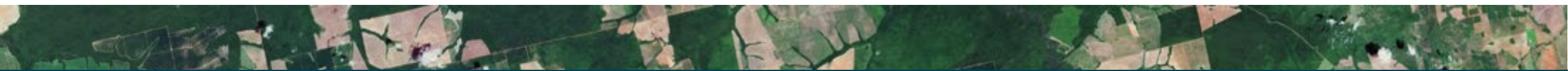
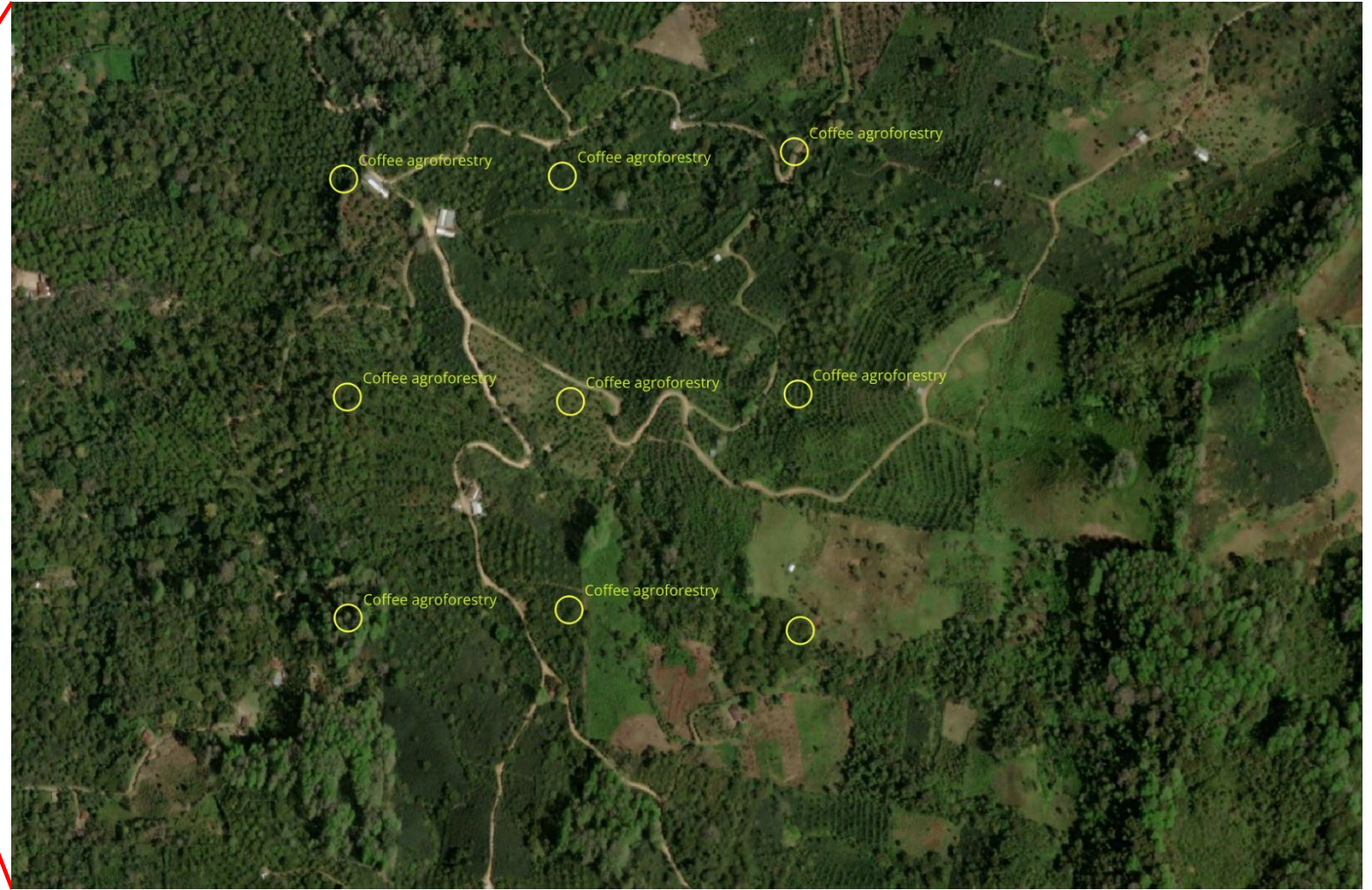
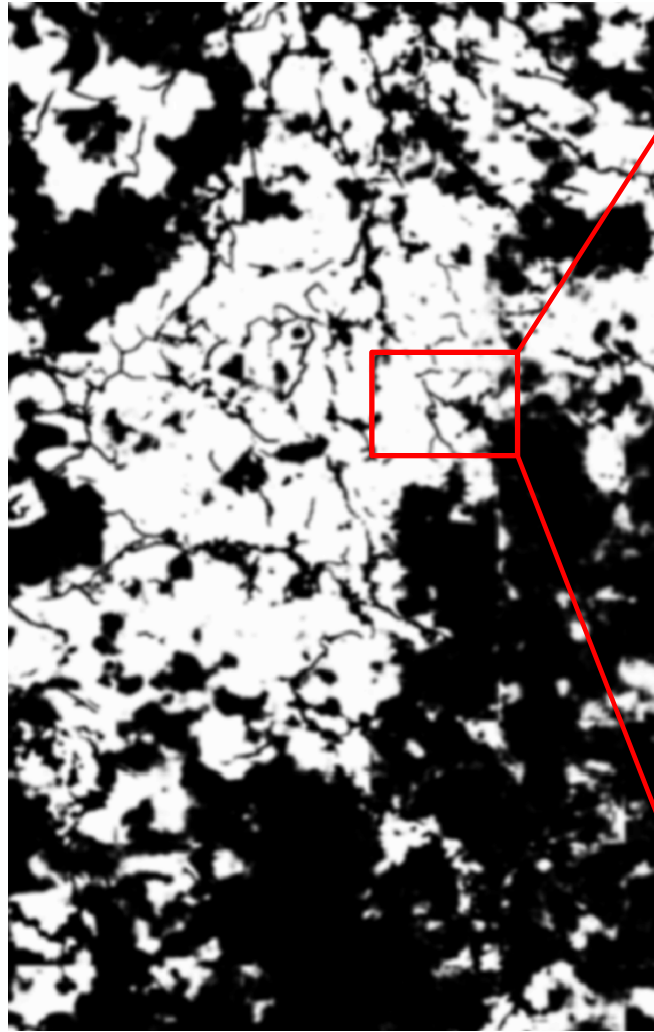
Contextual information	Sample image
Visual assessment of false-color RGB image, from Sentinel-2 2024 composite, together with target points for the test sites.	
Assessment of vegetation structure and pattern in comparison to classified location and ground truth data	
Assessment of spatial proximity of suspect agro-commodity points or land use to settlement	
Exploring Google Earth Pro high-resolution imagery and time-lapse to validate suspect agro-commodity land use	



First results – Coffee Honduras



First results – Coffee Honduras



First results – Coffee Honduras



Each fieldwork point is visited in 2025/2026 and consists of recording the main landuse and related parameters in a 15m radius circle, including photographs.

		Fieldwork (GEOGLAM)		
		coffee	non-coffee	UA
Map (WAC)	coffee	29	5	0,85
	non-coffee	3	40	0,93
PA		0,91	0,89	0,90



Future work & recommendations



- Validation work **ongoing** for all EUDR commodities over **~50 sites** of 50X50km,
- Close collaboration** with CNA's of various countries on **system design and demonstration**
- Use case** and **impact assessment** reports to be published in 2026.

- Highlight **advantages** of using **satellite** data for **EUDR** compliancy
- Lobby for **mandatory use of satellite data** for EUDR regulation (like EU Area Monitoring System)