The background of the slide is a light green and white gradient with silhouettes of various trees. On the left side, there is a large, dark green silhouette of a tree with dense foliage. At the bottom, there is a dark green silhouette of a forest floor with various plants and trees.

# **Spatial Monitoring of LUC for Effective Climate Policy Strategies: A Case Study of Romania's LULUCF Sector**

Raul Gheorghe RADU

National Research and Development Institute in Forestry

# Needed improvements/ New National arrangements



- Significant enhancements are required for Romania's GHGI in the LULUCF sector;
- Romania's delay in submitting the first draft of FRL, nearly missing the deadline;
- Numerous issues were identified by reviewers in the ARR;
- Predominant use of Tier 1 approach for estimating Emissions/Removals across most pools;
- Reporting areas based on outdated statistics, before the restitution process.

By government decision, new national arrangements were set for the LULUCF sector starting with the 2020 GHGI.

The task was distributed among four research institutes for FL, non-FL, soil, and remote sensing.

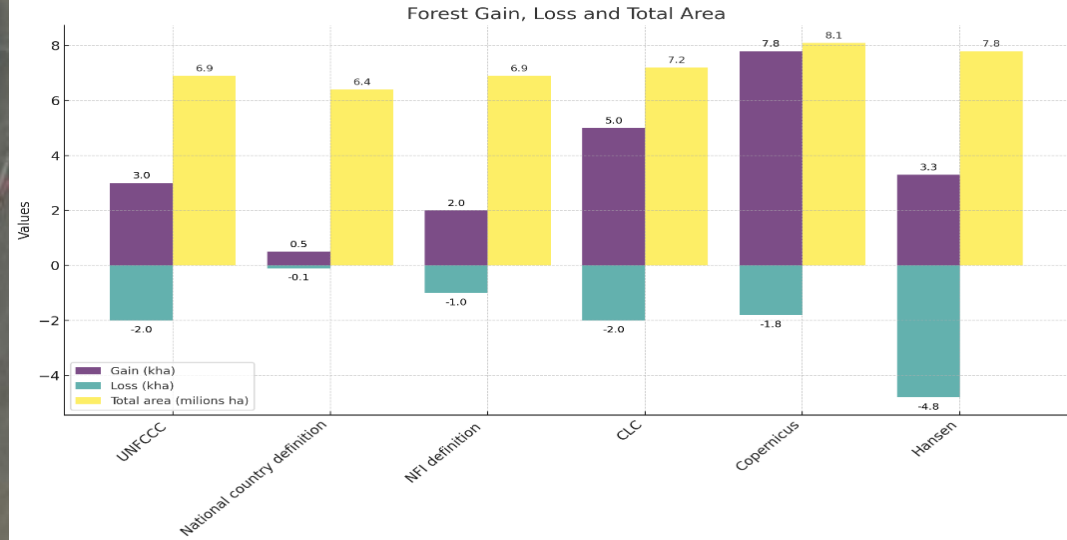
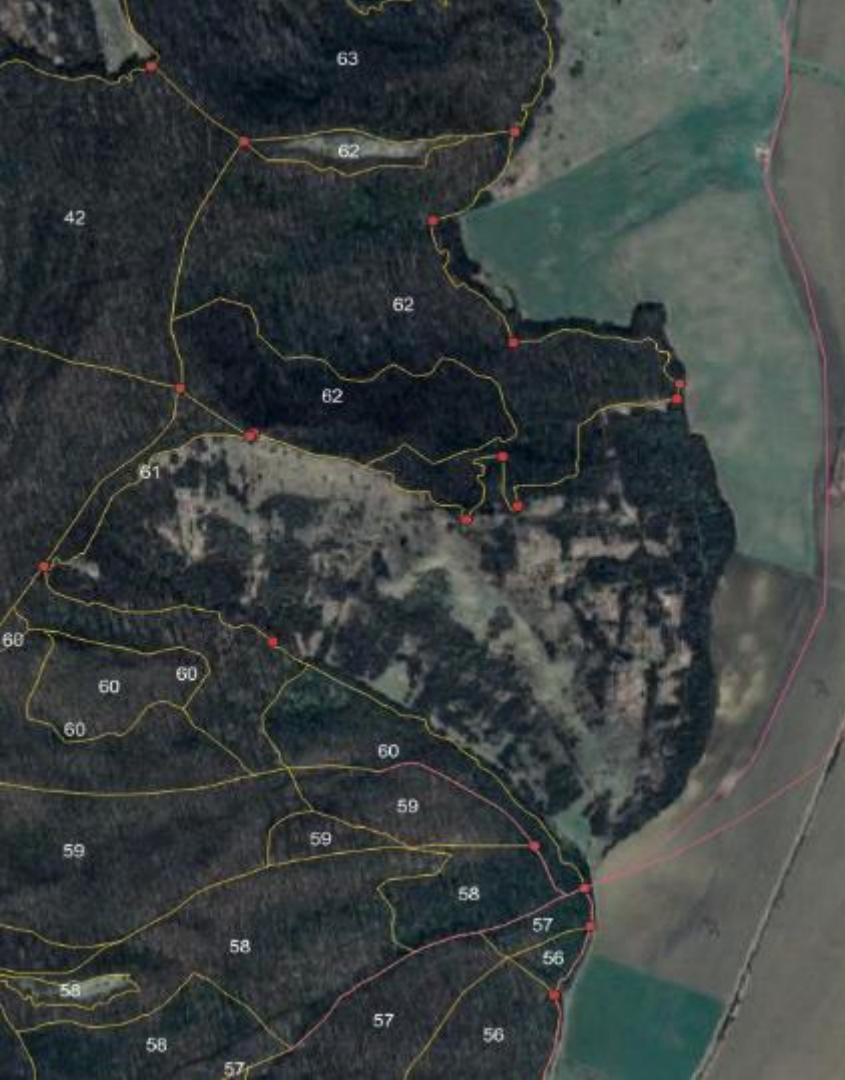
Data management within this framework is directed by specific legislation.

Contributions in data source by NFI, LPIS, ROSA, Cadastre Agency, NIS and Agency for Disastre Agency.

Shift from statistical methods to a comprehensive, geographically detailed approach utilizing multiple data sources.

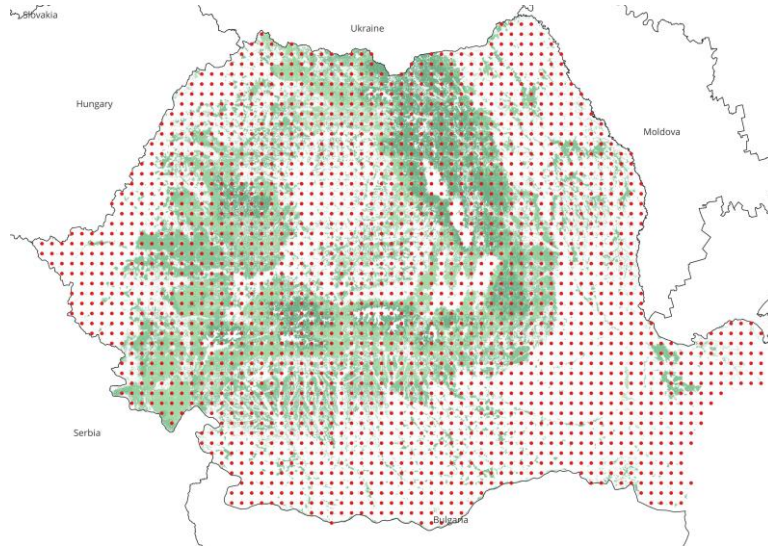
# Forest area

- Administrative boundary, managed by forest districts, mapped, and subject to forest management plans.
- A biological definition is defined in Annex 2 under the Convention.



# Objectives

Point sampling grid 100 x100 meters



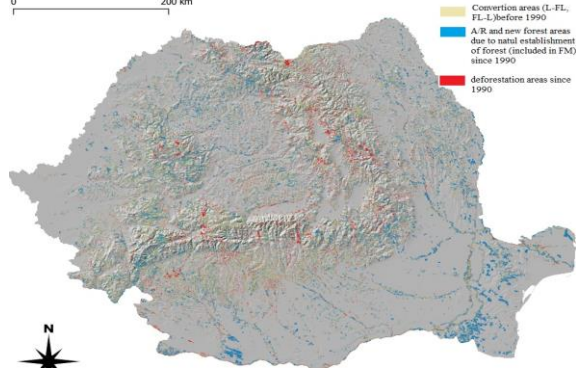
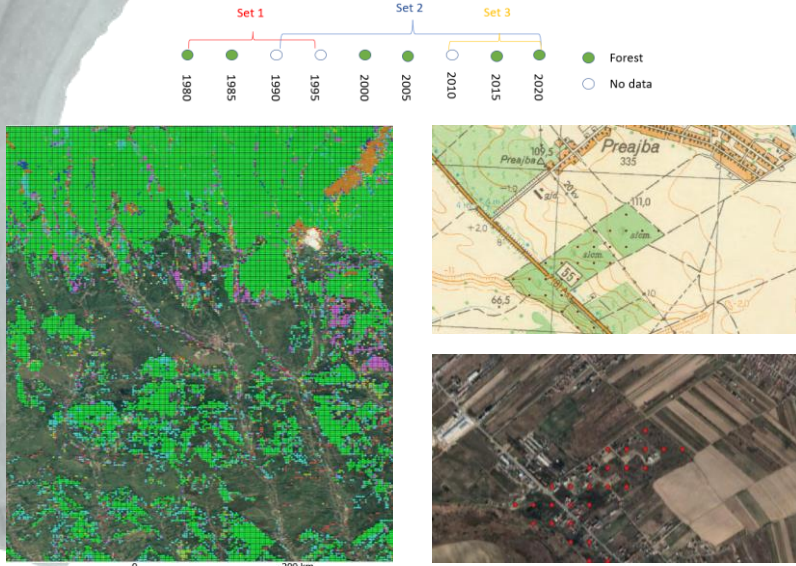
- **Create uniform LU data** for the time series;
- **Increase the accuracy** of annual changes in forest land use;
- **Include all national data** available and use and utilize available remote sensing products;
- **Meet the IPCC Guidelines** and LULUCF regulations;

Effort made by the reporting teams;

24 million points;

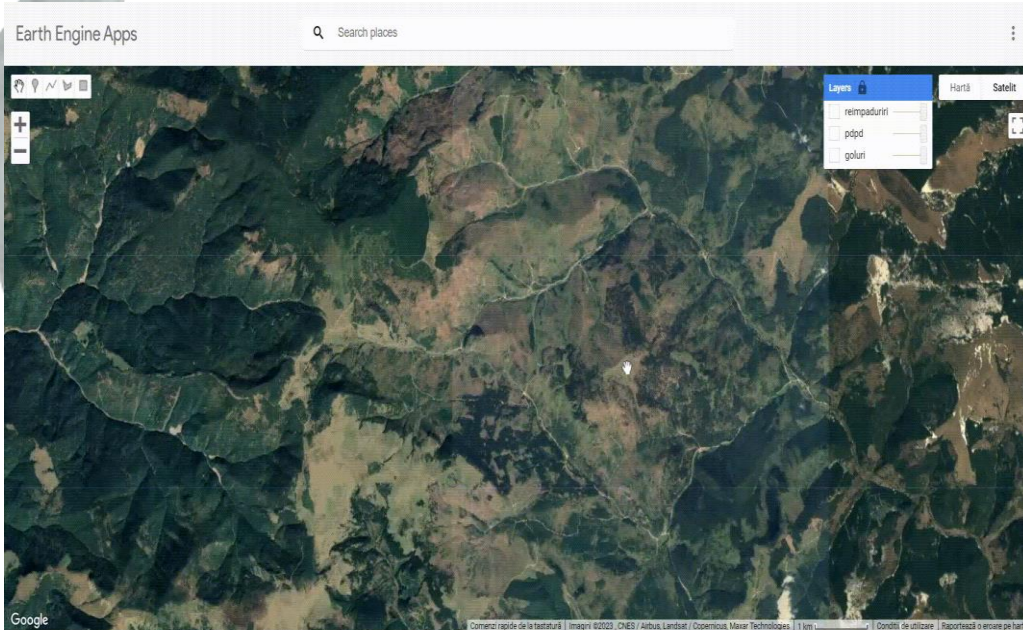
8 million points have FL information from 1980 – 2020.

# Overview of the model



- **Overlapping** spatial grids with land use/land cover (LU/LC) datasets.
- **Setting up nomenclatures** for defined or resampled products.
- Implementing a **data classification** algorithm.
- Generating the **preliminary spatial product**.
- Conducting manual **reclassification** for accuracy.

# Overview of the model



## National datasets

- Old datasets of topographic and military map;
- Forest district maps;
- LPIS/ IACS system;
- Cadastral LC maps;
- LC maps from orthophoto maps;

## Global/ regional products

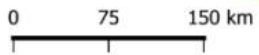
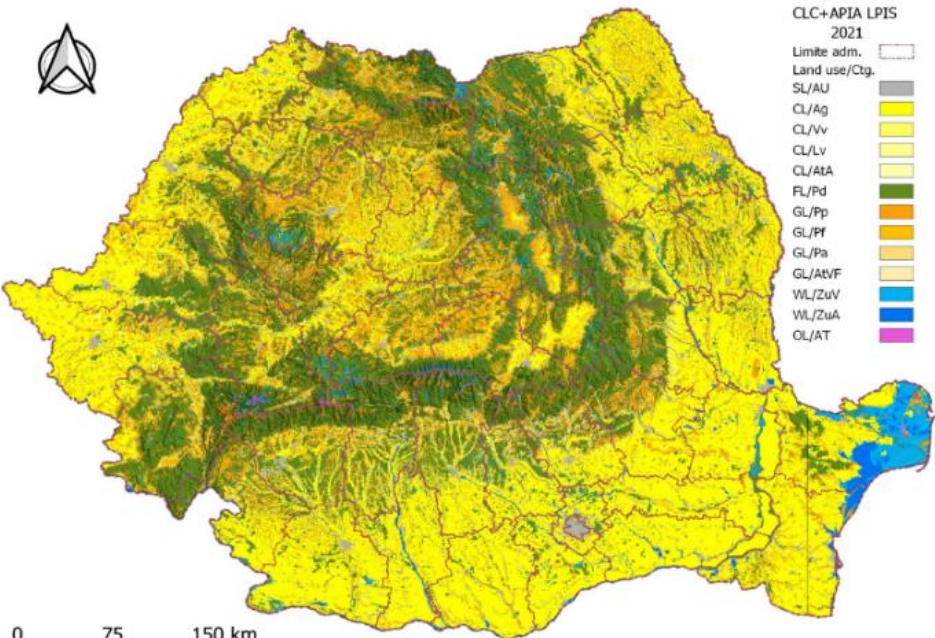
- CLC products;
- Copernicus products;
- Urban Atlas;
- Global datasets: Hansen et al., 2013; Potapov et al., 2015; Senf et al., 2021.

Available results public on Google Earth Engine

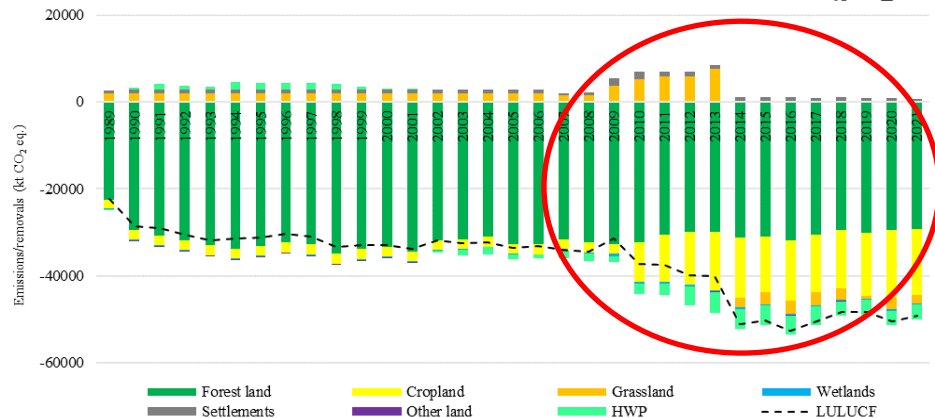
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# LULUCF sector



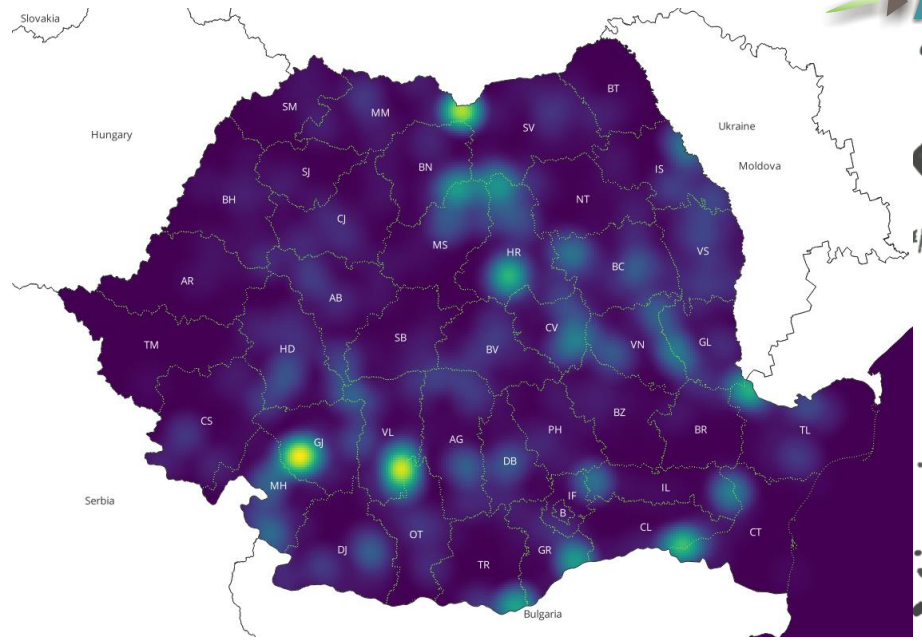
Higher spatial resolution



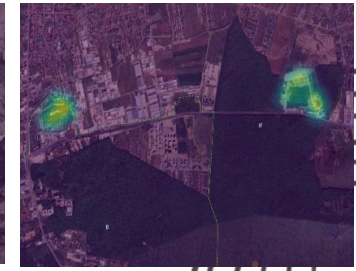
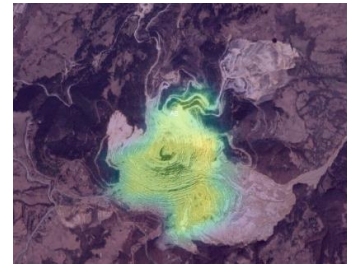
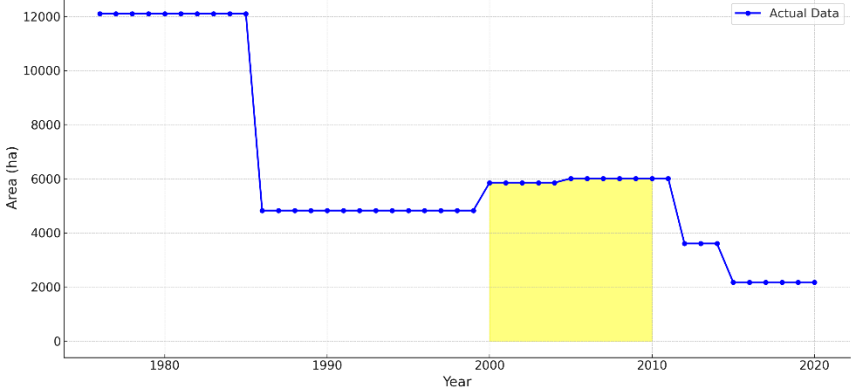
# Areas of deforestation map



- ❑ Larger areas than 10 ha;
- ❑ Trigger by policies;
- ❑ Land policies;
- ❑ Energy needs, before 1990;



Forest Loss by Year



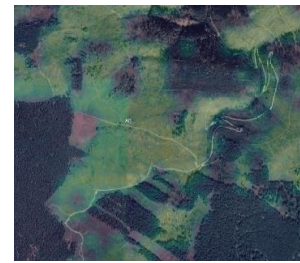
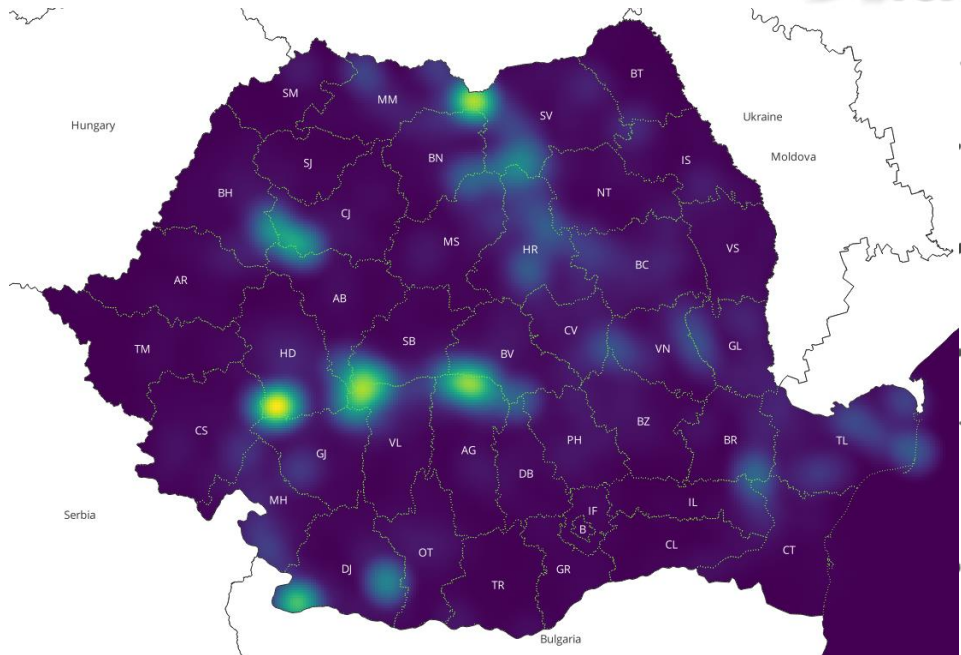


# Areas of forest degradation



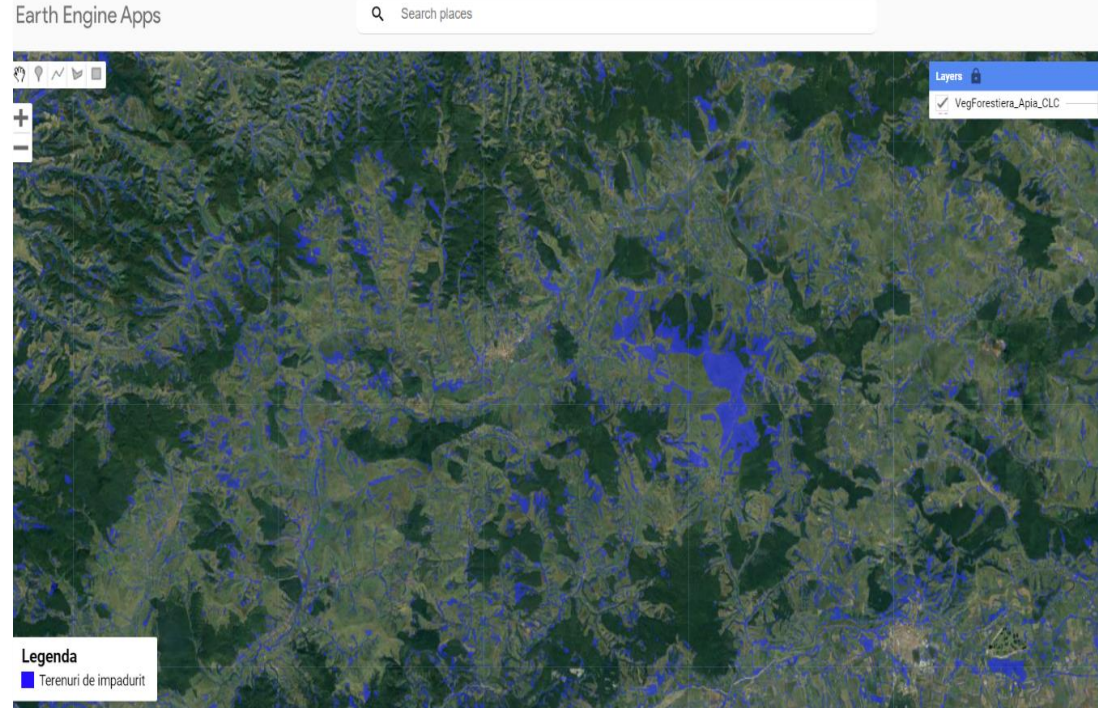
- ☐ Trigger by policies;
- ☐ Climate stress;
- ☐ Pressure from local communities;
- ☐ Lack of investments;

Forest degradation, emissions  
Need for local forest policies



# Potential afforestation land

- Potential land used for afforestation in the National Recovery and Resilience Plan;
- Not included in forest land use;
- Not included in LPIS;
- Not agricultural land, grassland, and urban fabrics, CLC and Urban Atlas;
- No land use defined in topographic or cadastral maps.



# Map of Forest Natural disturbance



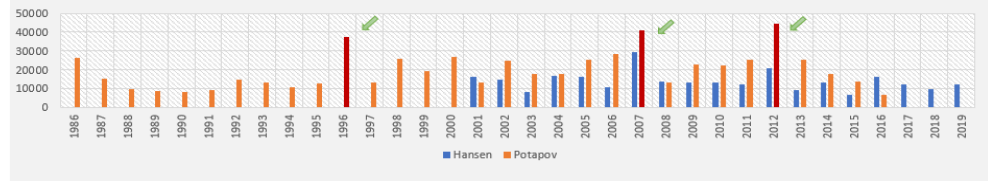
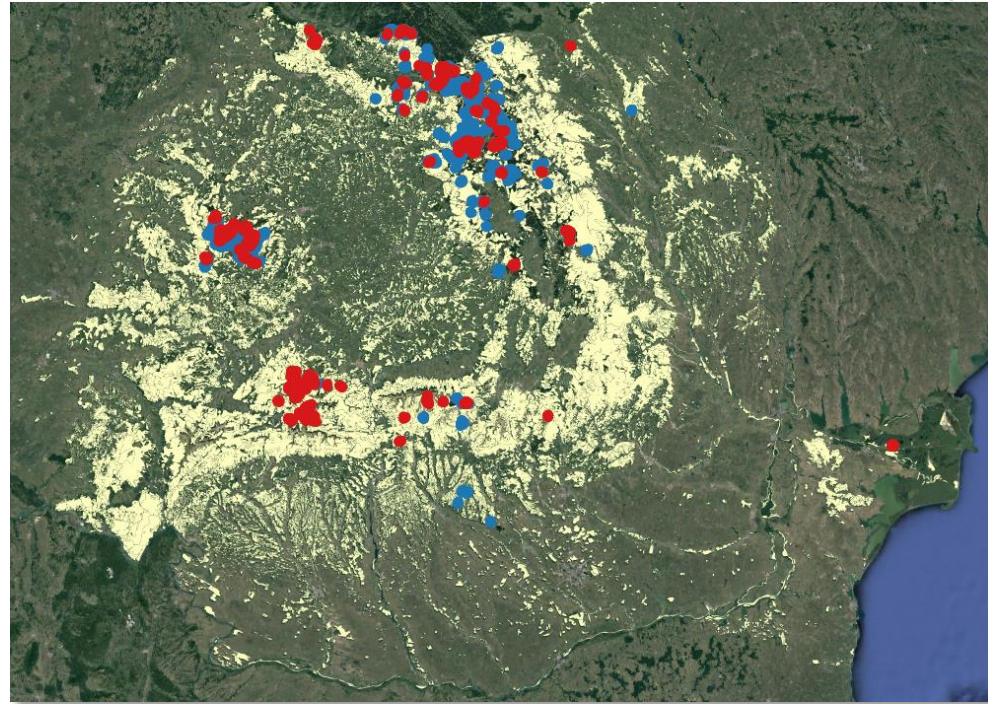
2012

- area covered of 3.3 kha
- mean alt. 1300 m
- 5 % of carbon sink/yr

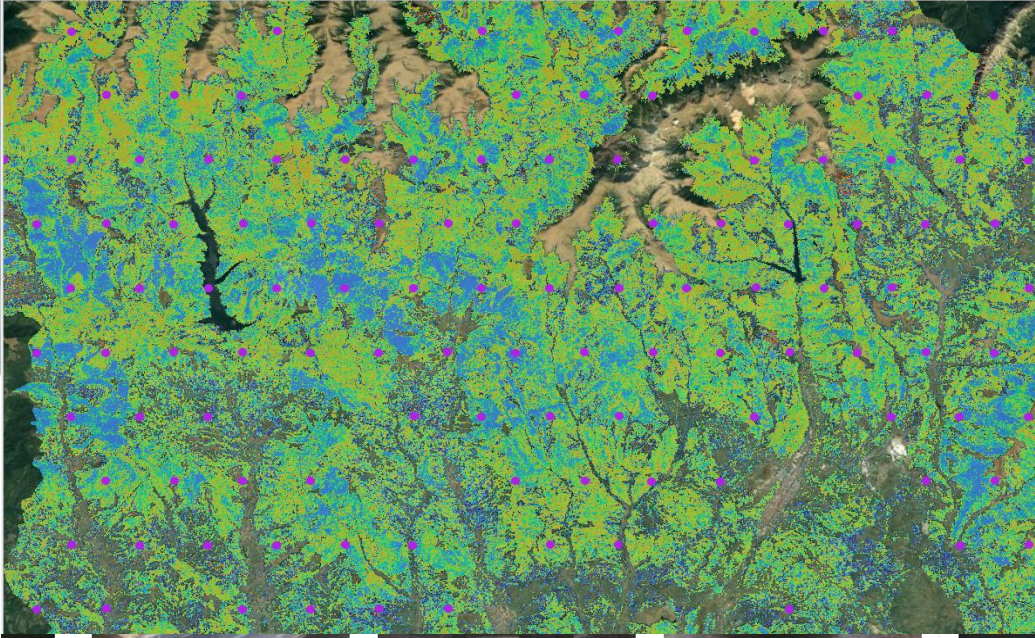


2007

- area covered of 7 kha
- mean alt. 1300 m
- 10 % of carbon sink/yr



## Further development



- Identify emission patterns.
- Deforestation rates increased post-2000 due to the forest restitution process but showed a decreasing trend from 2010-2015.
- Extend the spatial data monitoring system to other needs of the land sector.
- Policymakers can make evidence-based decisions backed by scientific data and evaluate the effectiveness of implemented policies.

The background features a light, hazy forest scene with various tree silhouettes. On the left side, there is a large, dark silhouette of a tree with a thick trunk and dense foliage. The rest of the background is filled with lighter, semi-transparent silhouettes of coniferous and deciduous trees, creating a sense of depth and a natural setting.

Thank you!

[raul.radu@icas.ro](mailto:raul.radu@icas.ro)

National Research and Development Institute in Forestry