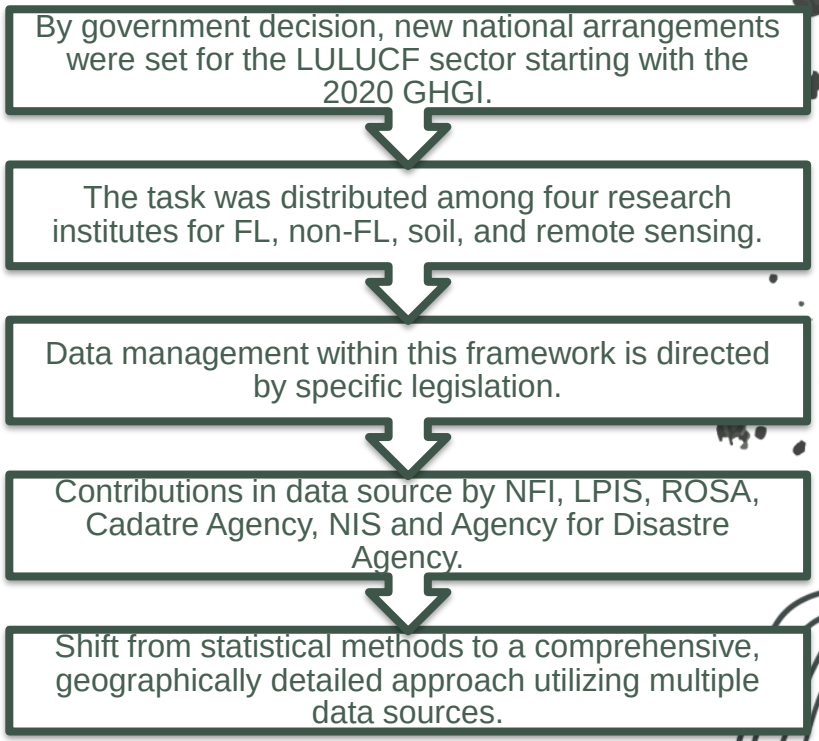
Spatial Monitoring of LUC for Effective Climate Policy Strategies: A Case Study of Romania's LULUCF Sector

Raul Gheorghe RADU

National Research and Development Institute in Forestry

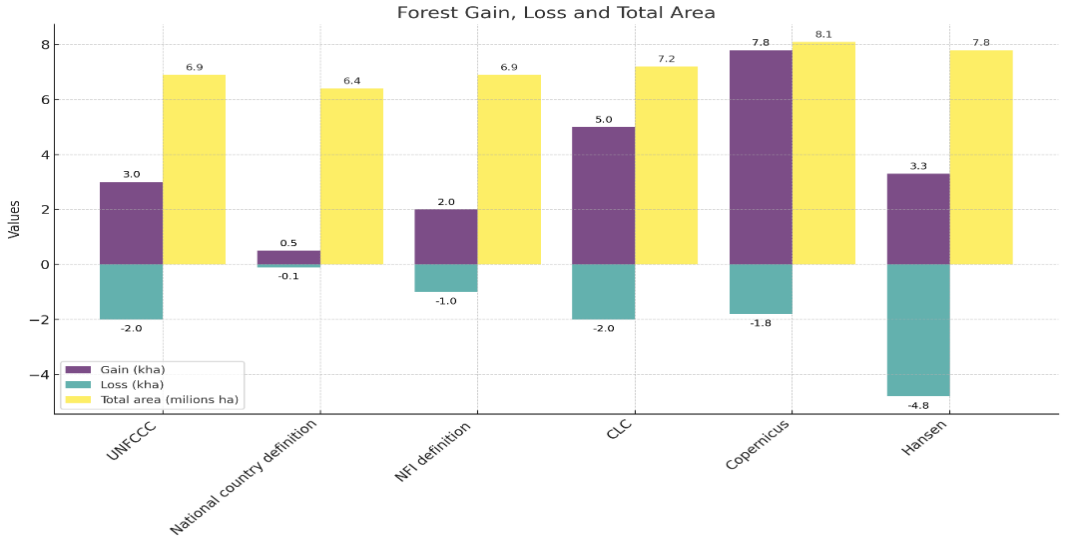
Needed improvements/ New National arrangements

- 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- Reporting areas based on outdated statistics, before the restitution process.



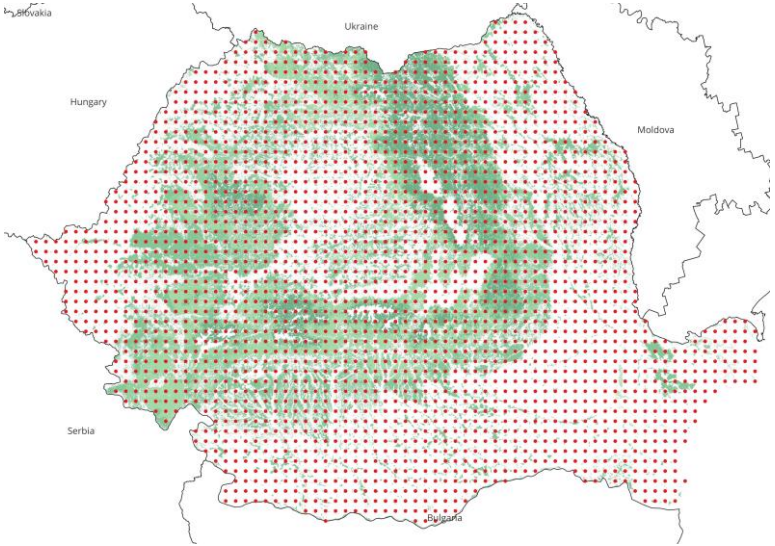
Forest area

- 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



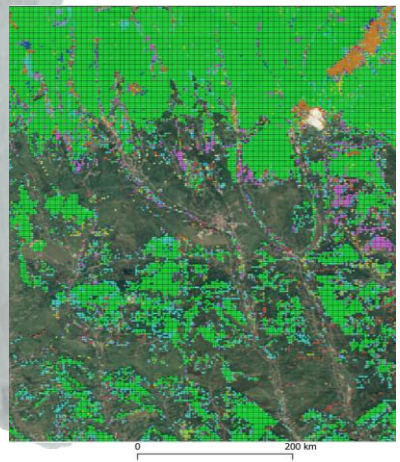
- **Create uniform LU data** for the time series;
- **Increase the accuracy** of annual changes in forest land use;
- **Include all national data** available and use and utilize available remote sensing products;
- **Meet the IPCC** Guidelines and LULUCF regulations;

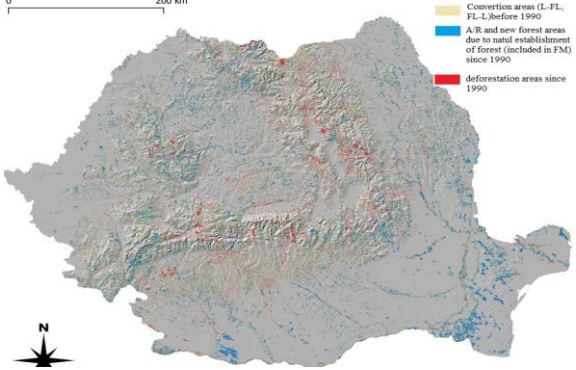
Effort made by the reporting teams;

24 million points;

8 million points have FL information from 1980 – 2020.

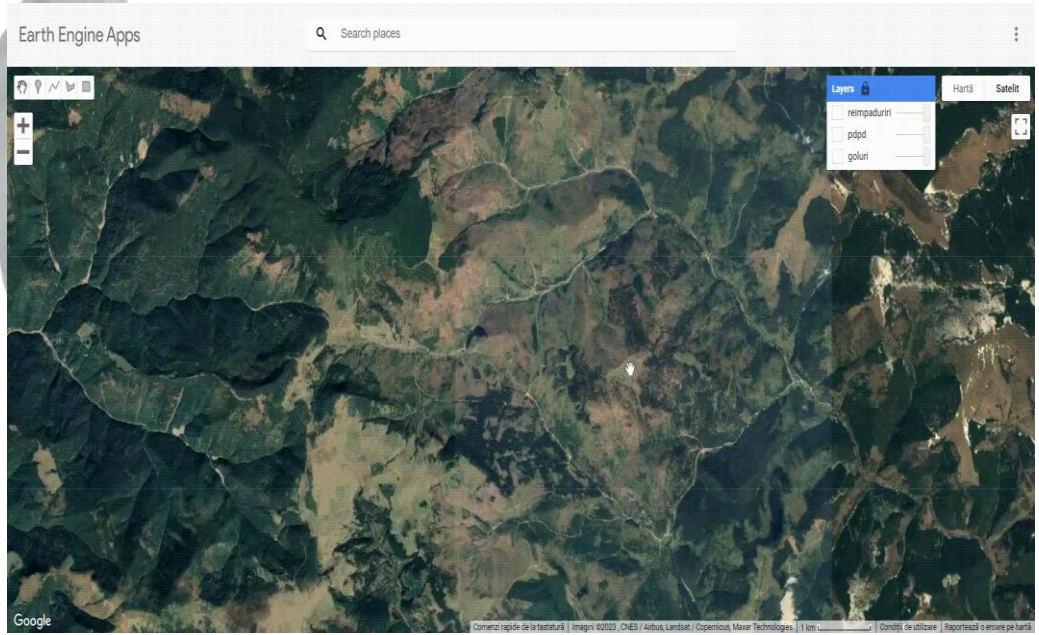
Overview of the model





- **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;

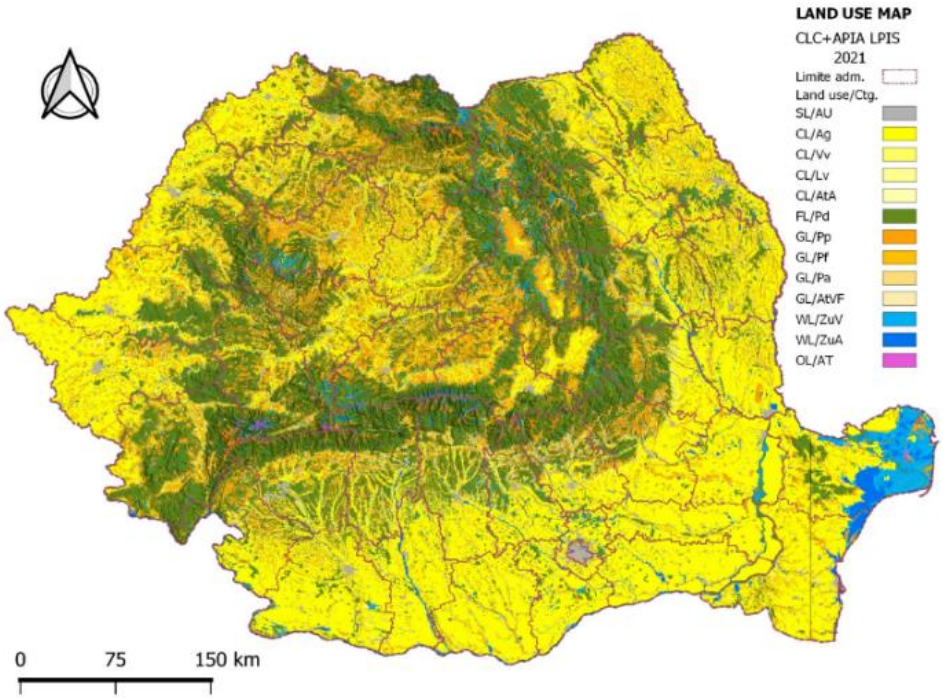
Global/ regional products

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

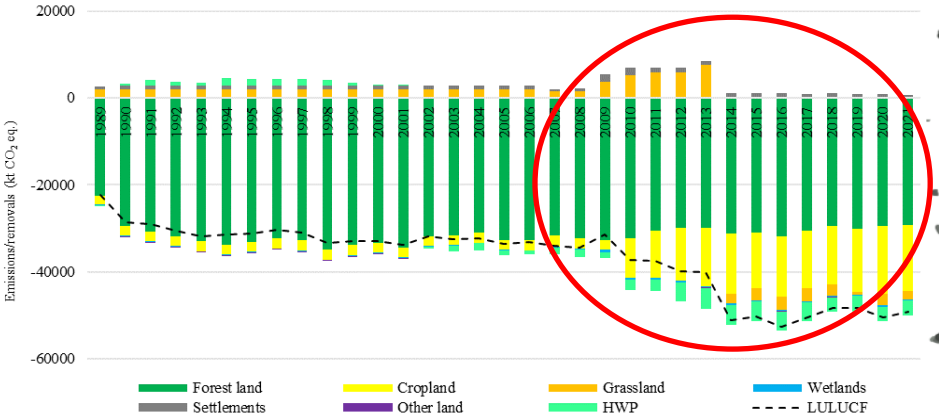
Available results public on Google Eart Engine

https://raulgradu.users.earthengine.app/view/lulucfro

LULUCF sector

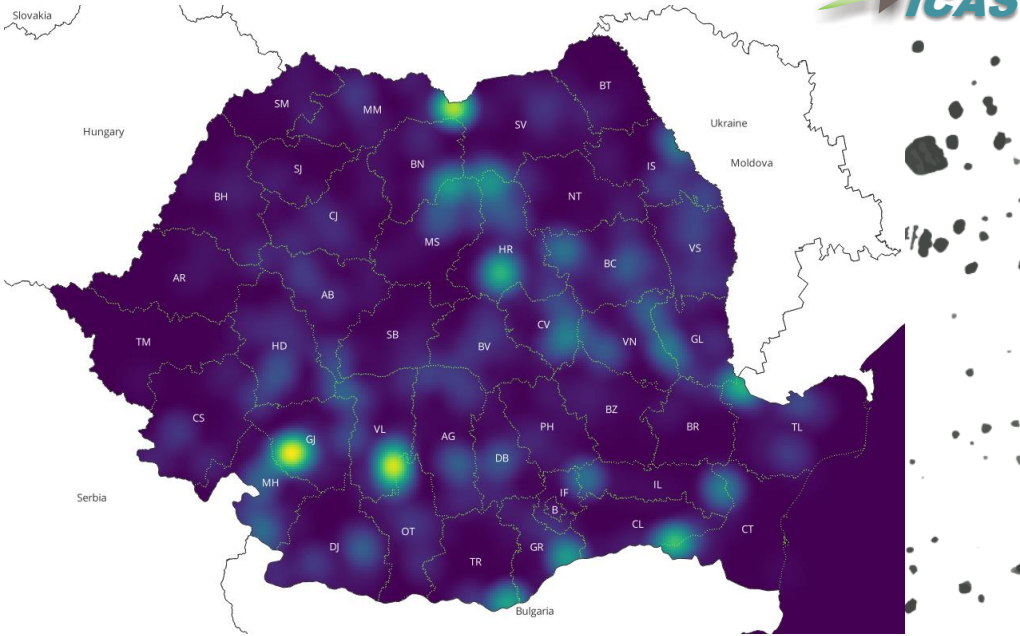


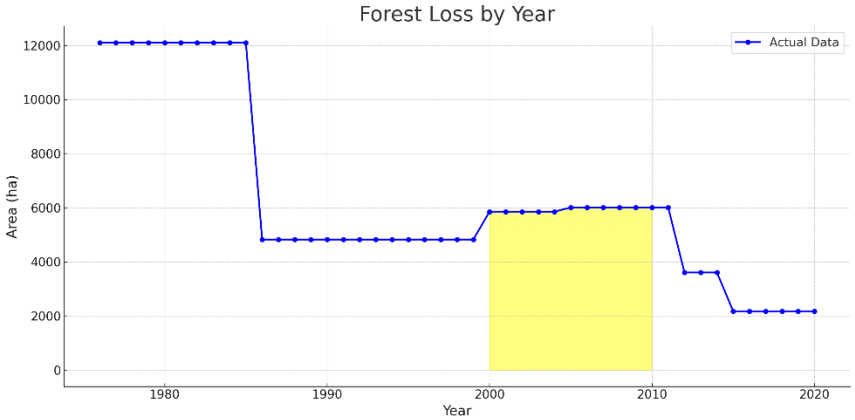
Higher spatial resolution

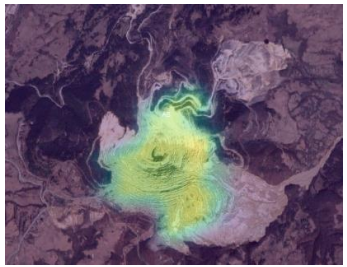


Areas of deforestation map

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



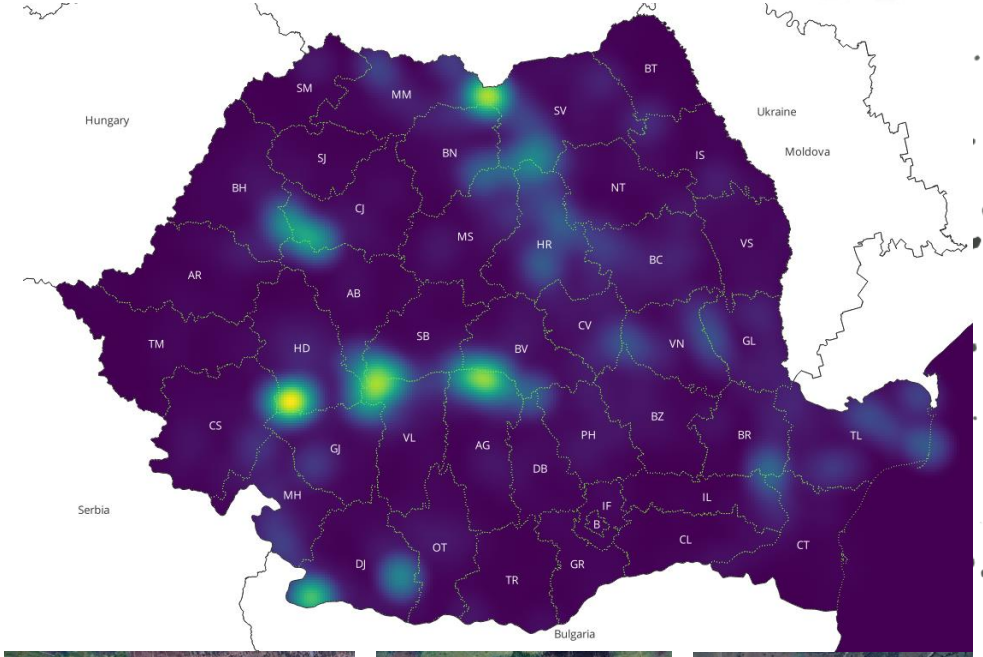


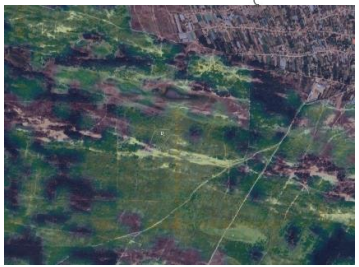


Areas of forest degradation

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

Forest degradation, emissions
Need for local forest policies



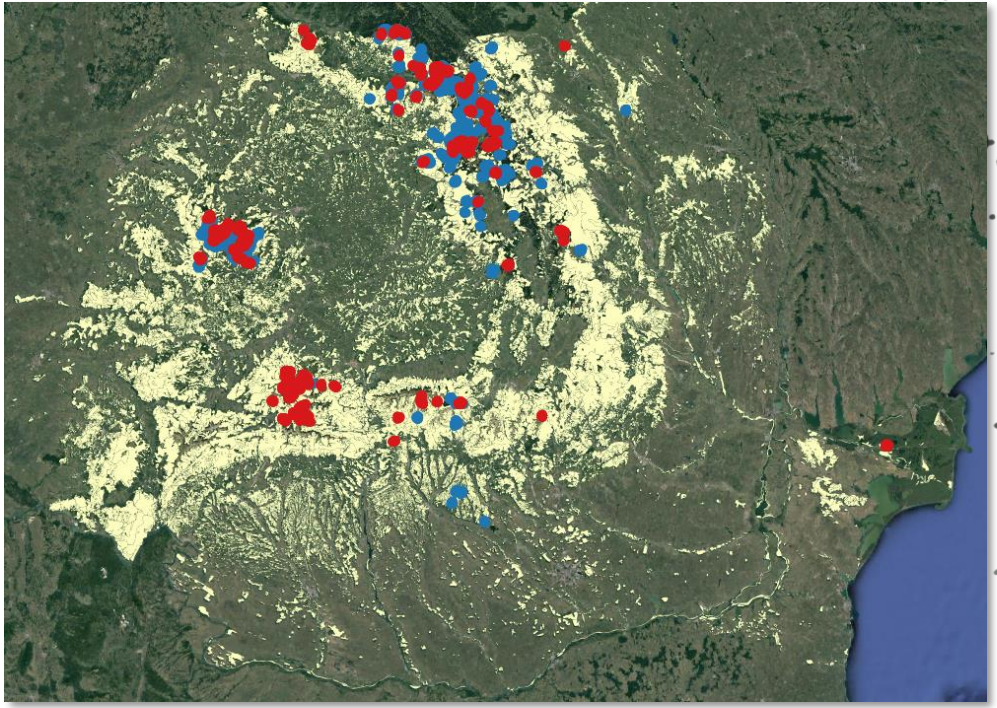


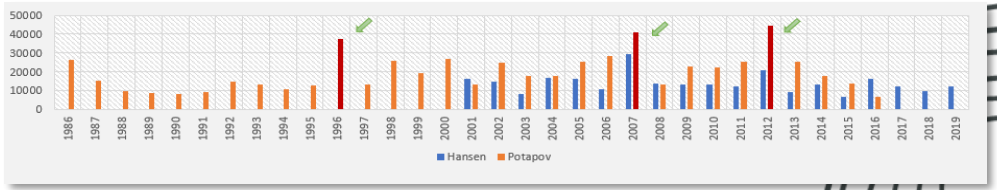
Potential afforestation land

- ❑ 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.

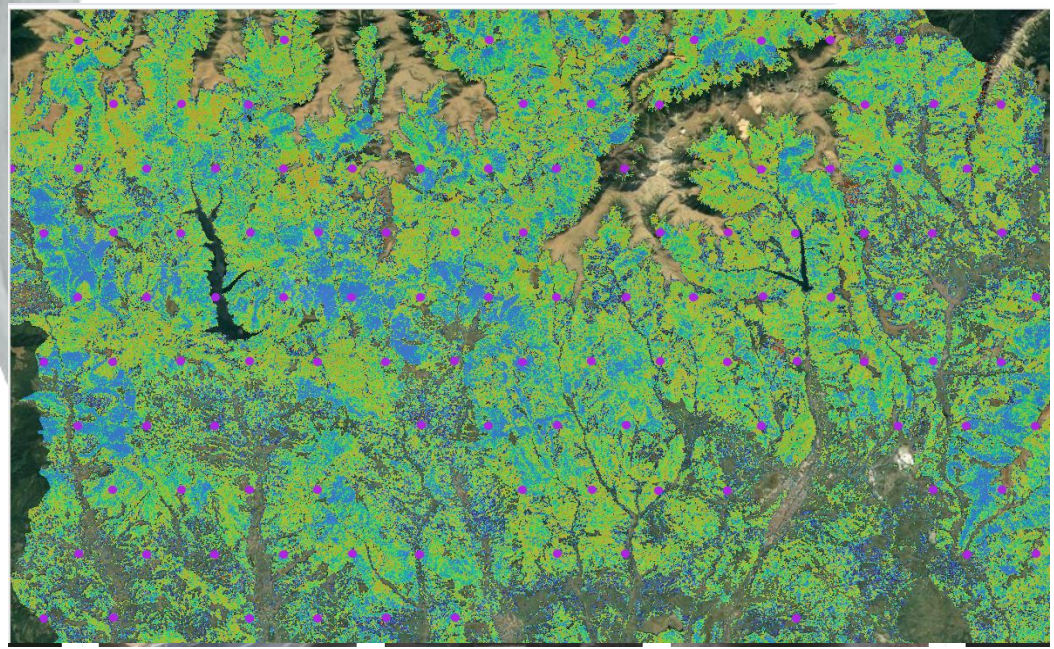
Map of Forest Natural disturbance

- 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.

•Extent 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.

Thank you!

raul.radu@icas.ro

National Research and Development Institute in Forestry