


# An overview of the end-to-end Python pipeline: From Sentinel-2 Tasking to Automated Risk Auditing.

## Keyword Search for any Region

EcoSentinel 

Select Region & Date

## Targeting Mode

☐ Use Presets

 Search Anywhere 

 Draw Area 

Enter Location

Kainuu, Finland

System will analyze a 10km radius.

✓ Coordinates Found

## Search Window

2024/06/01 – 2024/08/31

## Run Analysis



# EUDR Multi-Spectral Deforestation Engine

▼  About the Platform & Methodology

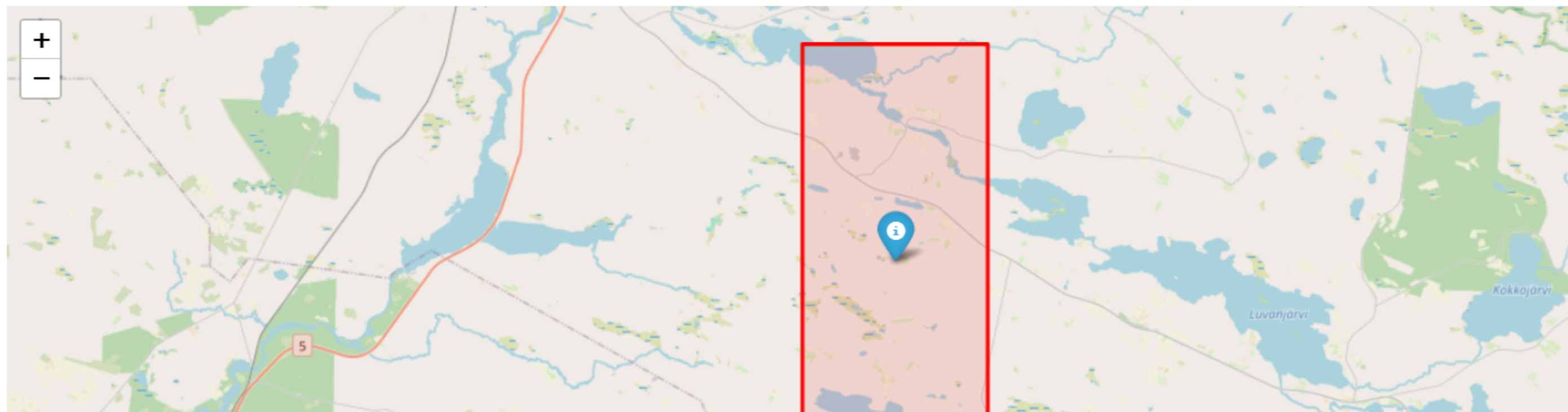
**Objective:** This platform provides real-time, satellite-based auditing for the **EU Deforestation Regulation (EUDR)**. It enables supply chain managers and financial auditors to verify if a sourcing region complies with environmental standards.

### How it works:

1. **Ingestion:** Tasks the **Sentinel-2 constellation** (via Microsoft Planetary Computer) to retrieve multi-spectral imagery.
2. **Processing:** Applies a parallelized Python pipeline to calculate **NDVI** (Vegetation Health) and **NDWI** (Water Content).
3. **Smart Masking:** Uses a Multi-Index Decision Tree to filter out urban noise and water bodies.
4. **Audit:** Generates a precise "Risk Score" based on vegetation stress levels.

**Target: Kainuu, Manner-Suomi, Suomi / Finland**

 Location & Targeting  Multi-Spectral Detection  Compliance Audit





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Run Analysis

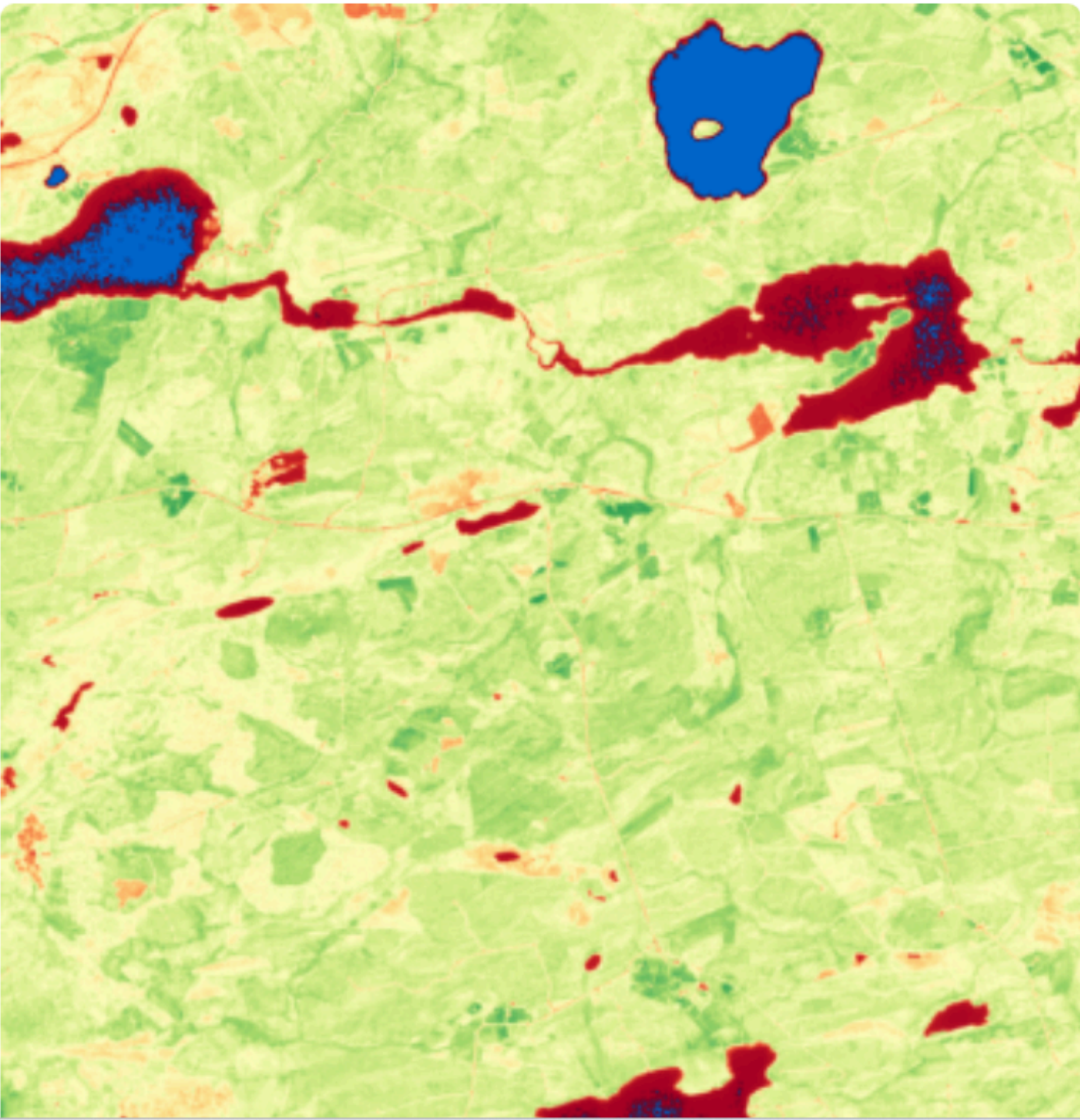
Target: Kainuu, Manner-Suomi, Suomi / Finland

Location & Targeting Multi-Spectral Detection Compliance Audit

Optical Reality



Multi-Spectral Deforestation Detection





localhost:8501

Step 3: Multi-Class Smart Masking.

Relaunch to update

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All Bookmarks

Deploy

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Kainuu, Finland

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Run Analysis

Multi-Class Masking & Compliance Map

## Step 4: Due Diligence Summary.

A generated risk assessment explaining the why and how of the result, ready for banking or supply chain audits.

coSentinel 🛰️

Select Region & Date

Targeting Mode

Use Presets

Search Anywhere 🌐

Draw Area ✎

Enter Location

Kainuu, Finland

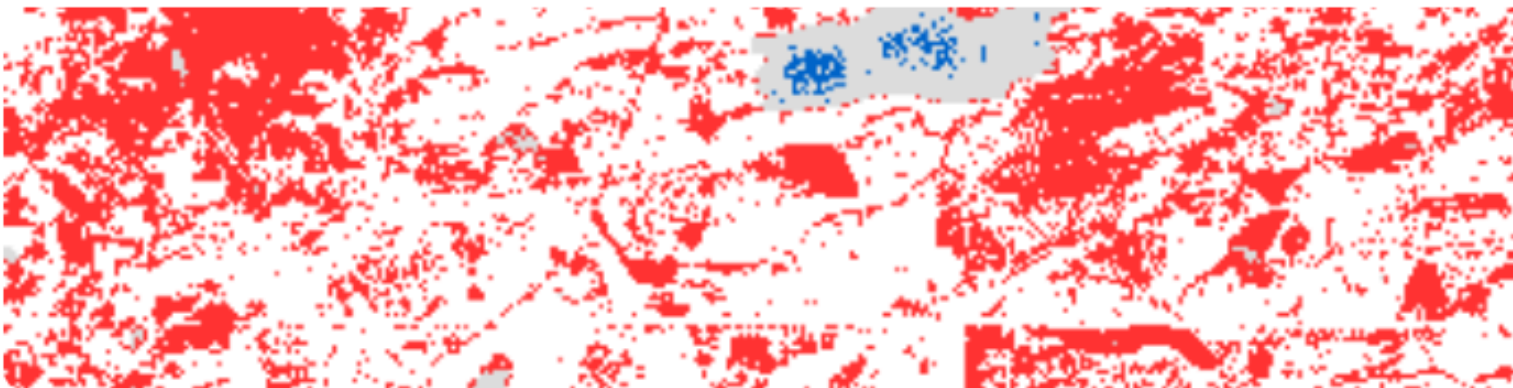
System will analyze a 10km radius.

✔ Coordinates Found

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🚀 Run Analysis



EUDR Classification Layer

### 🛡️ Executive Summary: 39.02% Risk (Compliant)

#### Risk Assessment:

The algorithm has identified that 39.02% of the agricultural vegetation in this sector is exhibiting **moderate spectral variation** (typical for this biome). Vegetation gaps are within standard agricultural or forestry tolerance (thinning/spacing).

#### 🔬 Algorithmic Methodology (Multi-Index Decision Tree):


- **BLUE (Water):** Masked via NDWI > 0 (Surface water bodies).
- **GREY (Urban/Barren):** Excluded where NDVI < 0.25 (Non-organic surfaces).
- **RED (Risk):** Vegetation with NDVI 0.25–0.45 (Sparse/Stressed signal).
- **WHITE (Safe):** Vegetation with NDVI > 0.45 (Dense chlorophyll signal).

*Data Validity Check: This analysis detected active vegetation cover of 92.72%. (Areas with < 10% cover may indicate invalid seasonal windows or desert terrain).*



## Step 5: Metadata Verification.

Ensuring data integrity by exposing the exact Sentinel-2 scene ID,  
 « cloud cover percentage, and acquisition timestamp.


EcoSentinel 

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2024/06/01 – 2024/08/31

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# EUDR Multi-Spectral Deforestation Engine

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**Target: Kainuu, Manner-Suomi, Suomi / Finland**

 Location & Targeting  Multi-Spectral Detection  Compliance Audit

Stress Area

39.02%

## Compliance

COMPLIANT

### Cloud Cover

0.0%

```
{
  "region_name": "Kainuu, Manner-Suomi, Suomi / Finland"
  "scene_id": "Mosaic_Composite"
  "acquisition_date": "2024-08-07T09:55:49.024000+00:00"
  "cloud_cover_avg": 0
  "platform": "Sentinel-2B"
  "bbox": [
    0 : 28.631052399999998
    1 : 64.5446354
    2 : 28.7310524
    3 : 64.6446354
  ]
}
```