Step 1: The Architecture.

An overview of the end-to-end Python pipeline:

From Sentinel-2 Tasking to Automated Risk Auditing.

Draw Area on Map

EcoSentinel

Select Region & Date

Targeting Mode

- Use Presets
- Search Anywhere
- Draw Area

Use the drawing tools on the 'Location' map.

Search Window

2025/03/01 – 2025/03/31

Run Analysis

Deploy

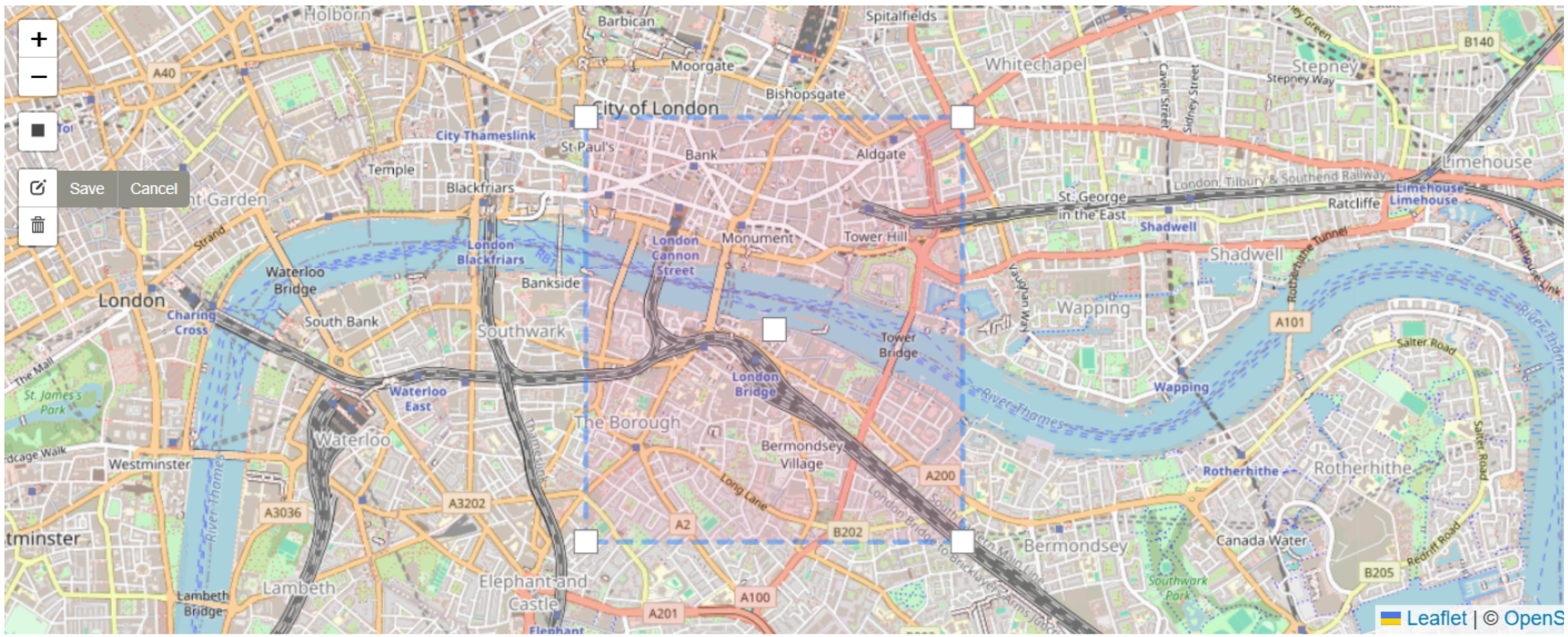
EUDR Multi-Spectral Deforestation Engine

About the Platform & Methodology

Target: Custom User Selection

Location & Targeting | Multi-Spectral Detection | Compliance Audit

Interactive Targeting Map



Step 2: Spectral Analysis.

Visualizing the raw NDVI/NDWI layers to establish a baseline for agricultural health before applying compliance thresholds.

Location & Targeting | Multi-Spectral Detection | Compliance Audit

EcoSentinel

Select Region & Date

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Search Window

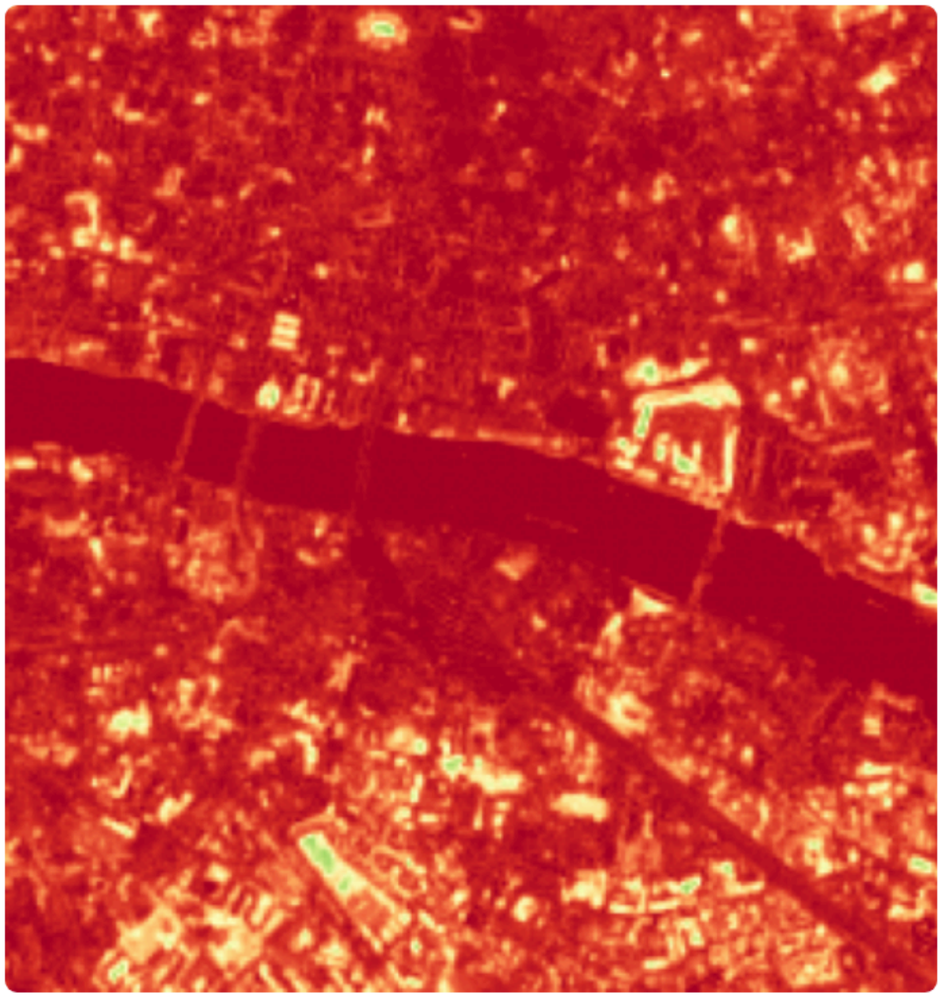
2025/03/01 – 2025/03/31

Run Analysis

Optical Reality

Sentinel-2 Composite (Visible Light)

Multi-Spectral Deforestation Detection



Hybrid Spectral Analysis (NDVI + NDWI)

Step 3: Multi-Class Smart Masking.
Applying the Decision Tree: Blue (Water), Grey (Urban), Red (Risk), and White (Safe) for pixel-perfect accuracy.

EcoSentinel

Select Region & Date

Targeting Mode

- Use Presets
- Search Anywhere
- Draw Area

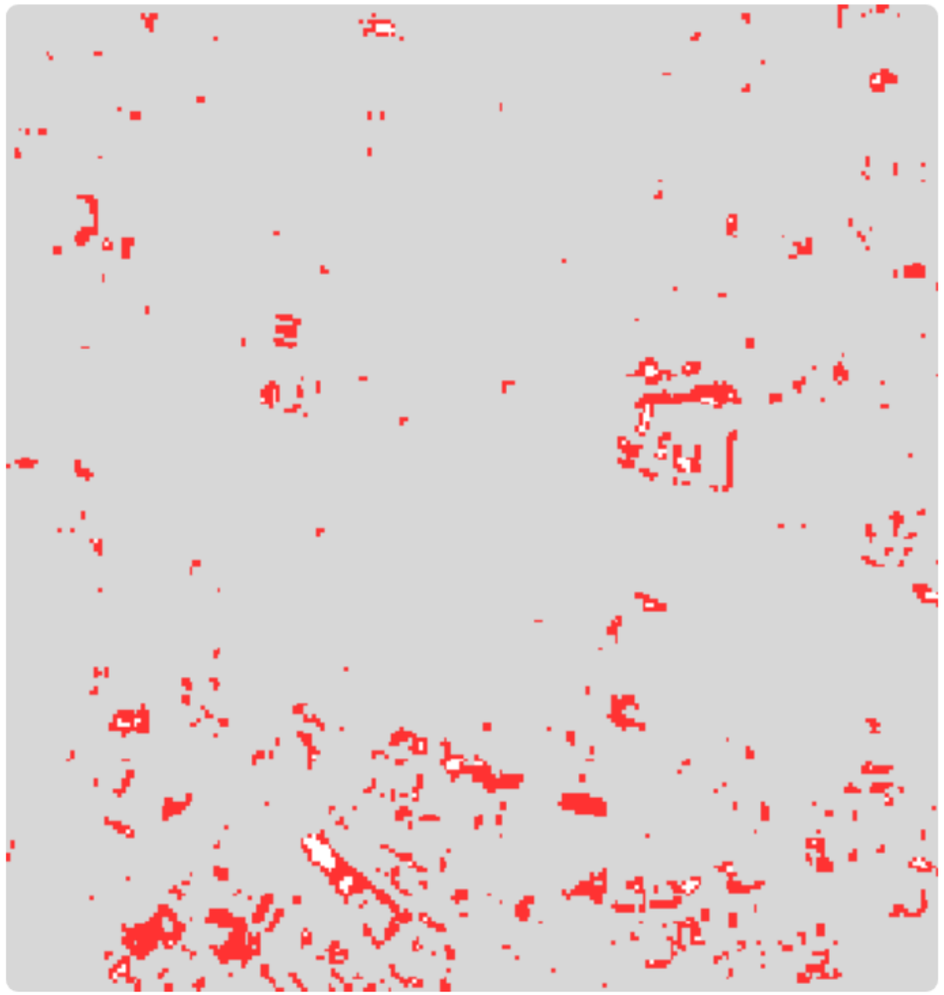
Use the drawing tools on the 'Location' map.

Search Window

2025/03/01 – 2025/03/31

Run Analysis

Multi-Class Masking & Compliance Map



EUDR Classification Layer

Step 4: Due Diligence Summary.

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

EcoSentinel

Select Region & Date

argeting Mode

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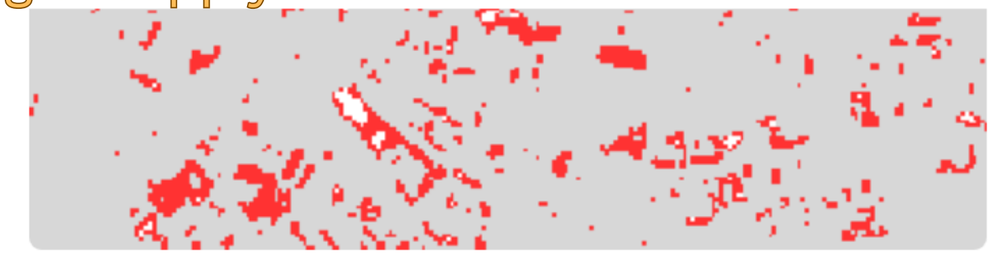
Use the drawing tools on the 'Location' map.

earch Window

2025/03/01 – 2025/03/31

Run Analysis



EUDR Classification Layer

Executive Summary: 93.63% Risk (Critical Risk)

Risk Assessment:

The algorithm has identified that **93.63%** of the agricultural vegetation in this sector is exhibiting **critical spectral stress** (Red Zones). This indicates potential deforestation or severe drought. Immediate on-site audit recommended.

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).

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*Data Validity Check: This analysis detected active vegetation cover of **4.64%**. (Areas with < 10% cover may indicate invalid seasonal windows or desert terrain).*