

**Leveraging high temporal satellite imagery  
for forestry monitoring**

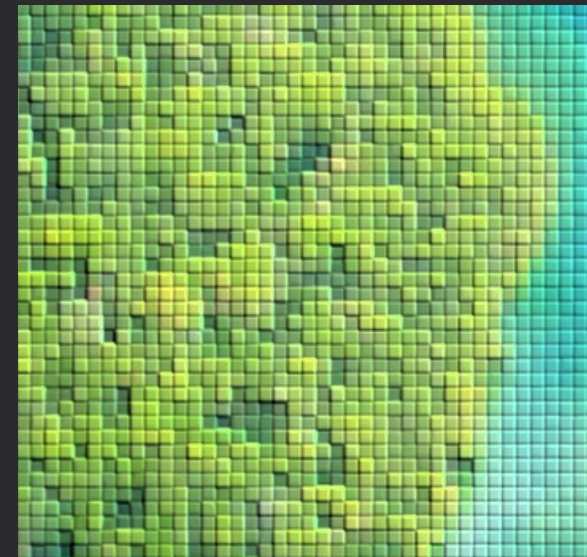
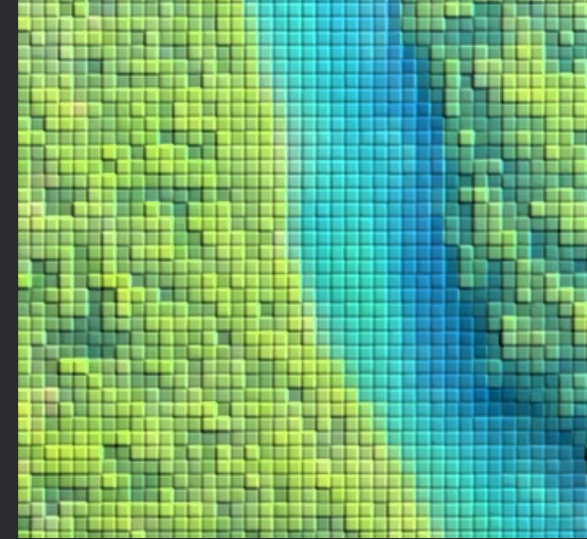
**GWF 2023**

**Michael Breetzke**

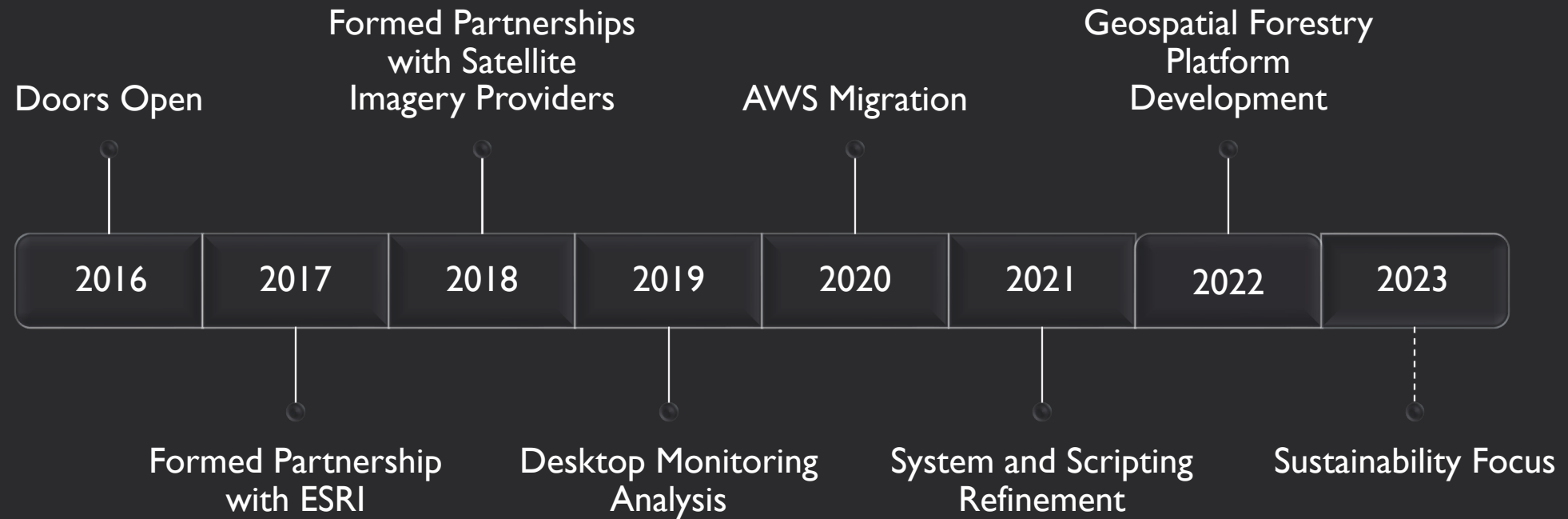


# Contents

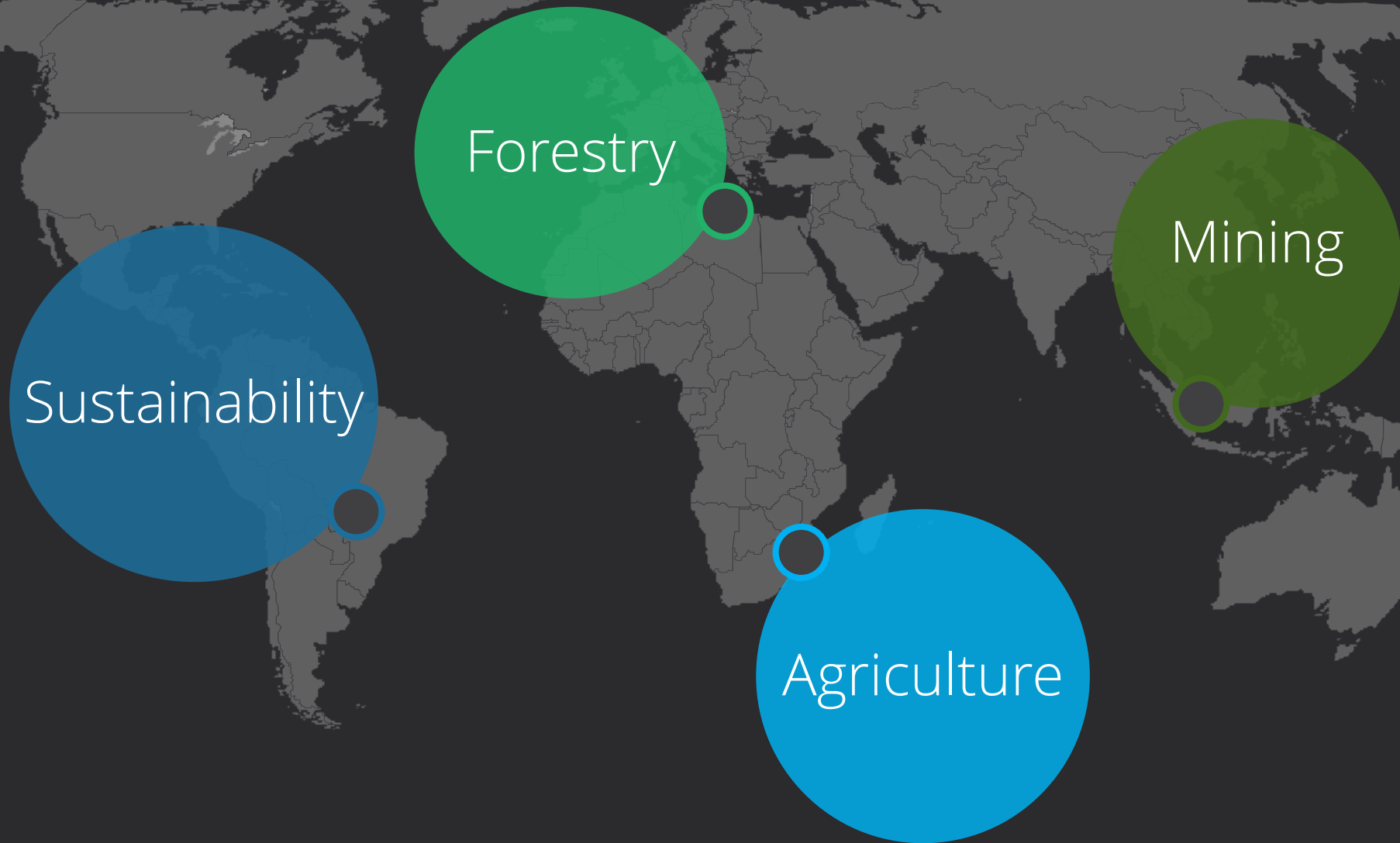
- Swift Geospatial Introduction
- Partner Introduction
  - Hardware, Software & Data
- Satellite Imagery Options
  - What works best (in our opinion)
- Workflow
  - Putting it all together
- Outputs
  - Results and sharing
- Use Case
  - Barry Callebaut



# GIS and Remote Sensing Company



# GIS and Remote Sensing Company





# Partners – Data and Technology



Capella Space



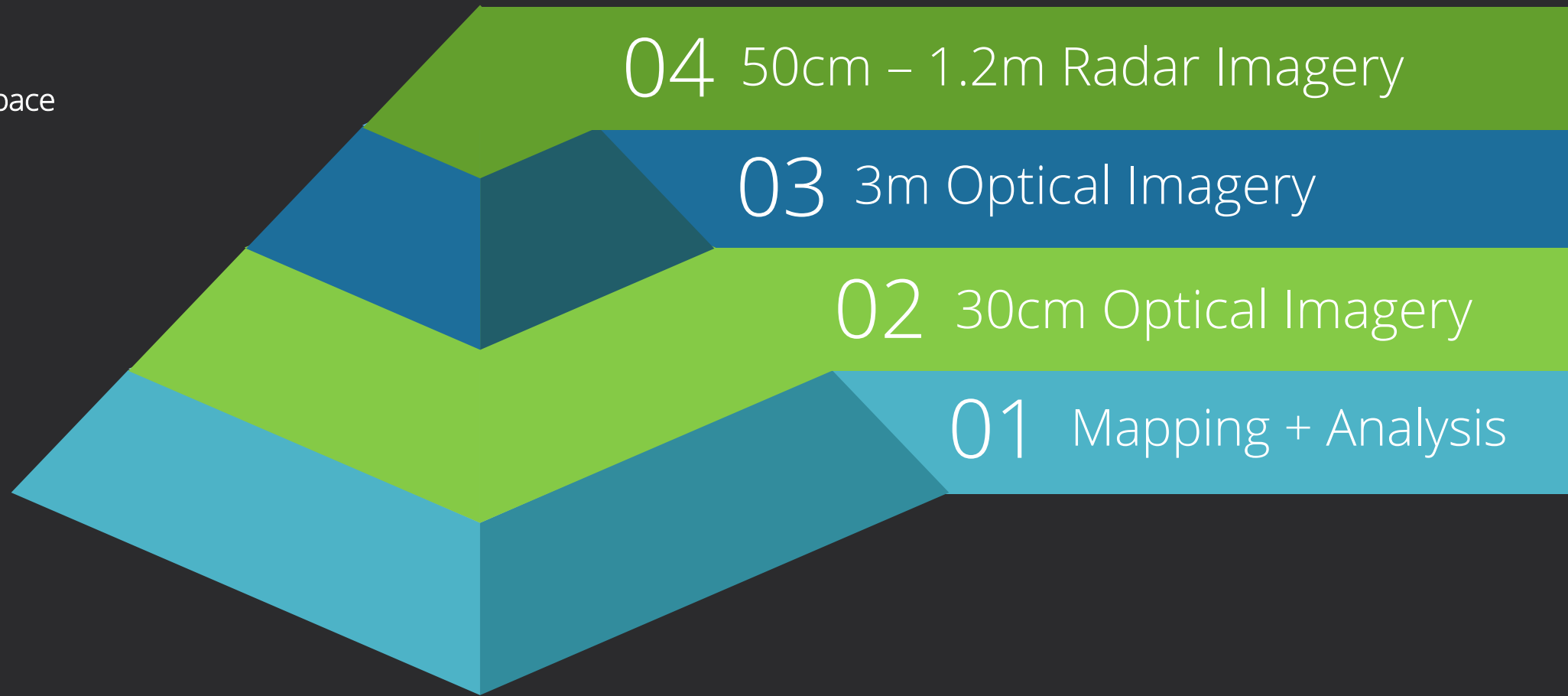
Planet



Maxar



ESRI





# Satellite imagery options



## Sentinel-1

Free to use  
10m resolution  
1 band  
12-Day collection



## Sentinel-2

Free to use  
10m/20m resolution  
13 bands  
5-Day collection



## Planet-Doves

Paid to use  
3m resolution  
8 bands  
Daily collection



## Maxar

Paid to use  
30/50cm resolution  
4-16 bands  
Ad-hoc collection

Resolution

40%

40%

70%

100%

Bands

10%

90%

60%

80%

Frequency

50%

70%

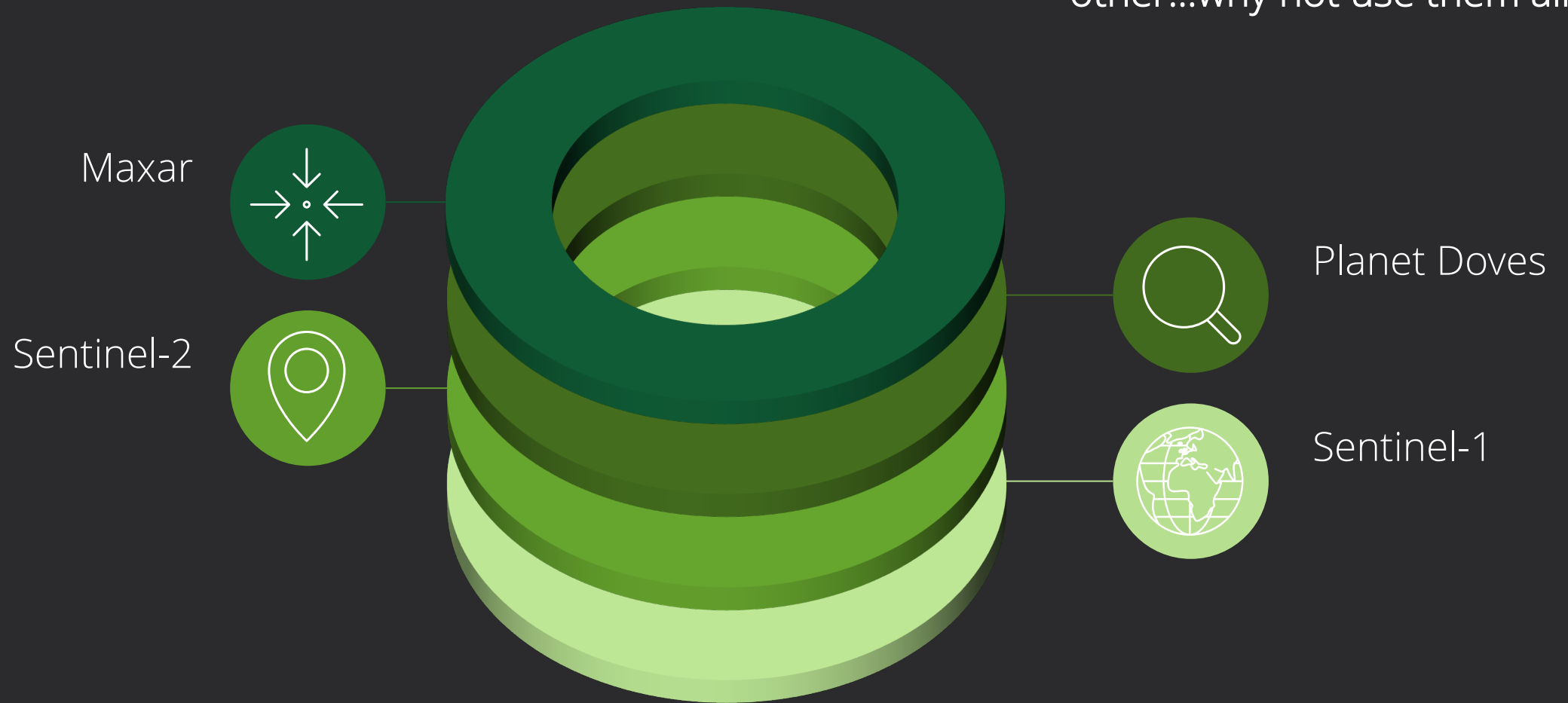
100%

10%



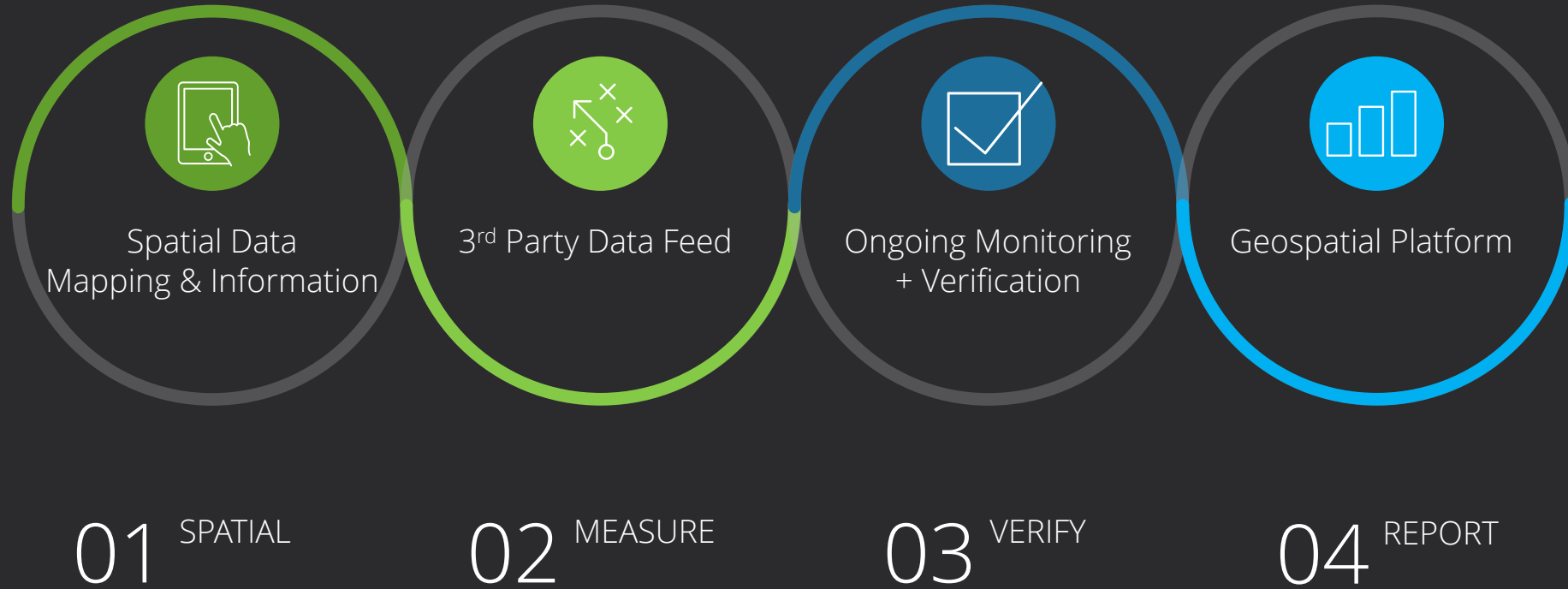
# Satellite imagery options

Instead of using one or the other...why not use them all





# Workflow



# Workflow



SURVEY123



COLLECTOR



QUICK CAPTURE

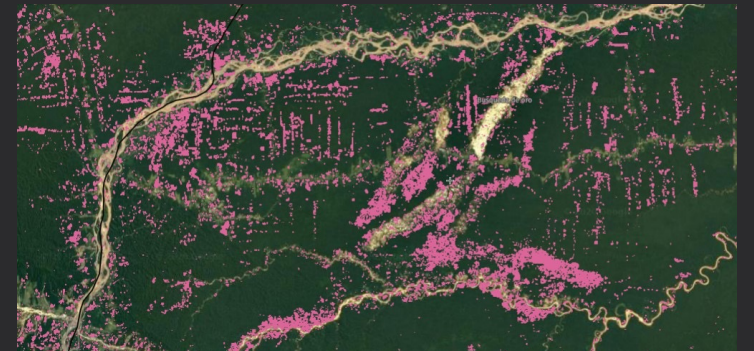
01 SPATIAL

# Workflow

Radar satellite imagery from the European Space Agency's Sentinel-1 mission is used to map new disturbances in primary humid tropical forest at 10 m spatial scale and in near real-time. (RADD)



GLAD uses imagery from NASA's Landsat satellites to automatically flag areas where the forest canopy has been disturbed. (GLAD-L and GLAD-S).



The INPE programs are vital to keep the forest standing. While Prodes generates annual deforestation rates, Deter makes daily alerts to improve monitoring against tree cutting and fires.



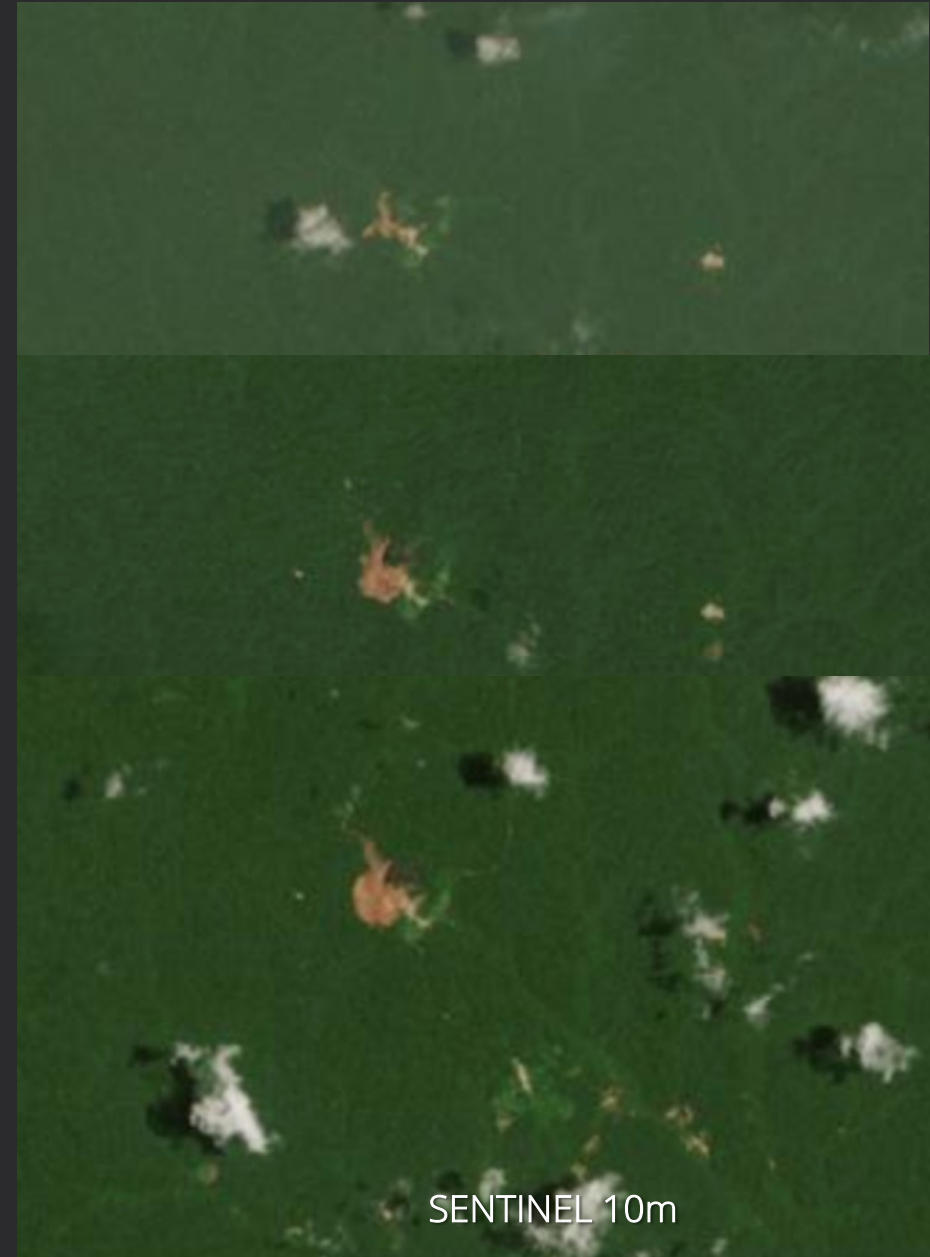
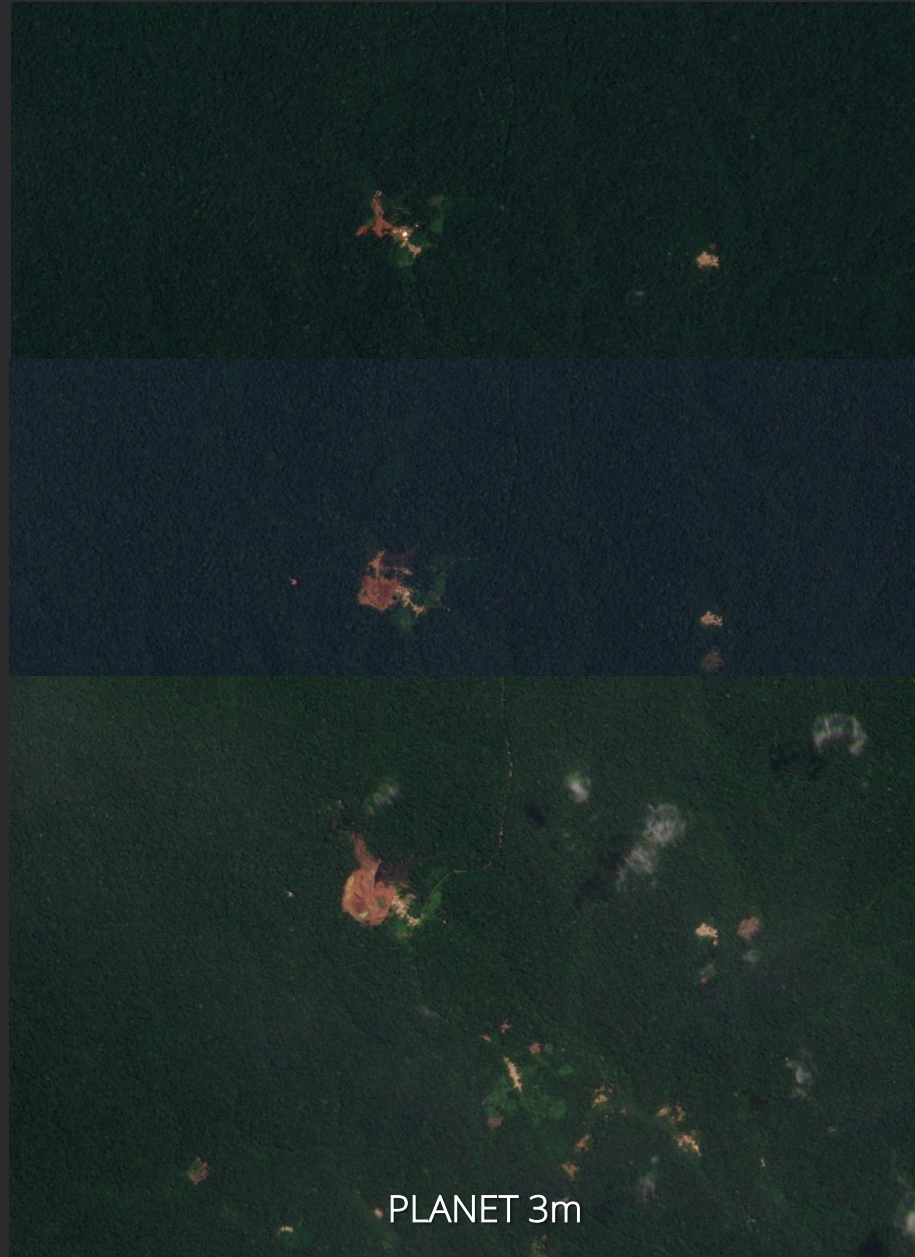
02 MEASURE



# Workflow



02 MEASURE

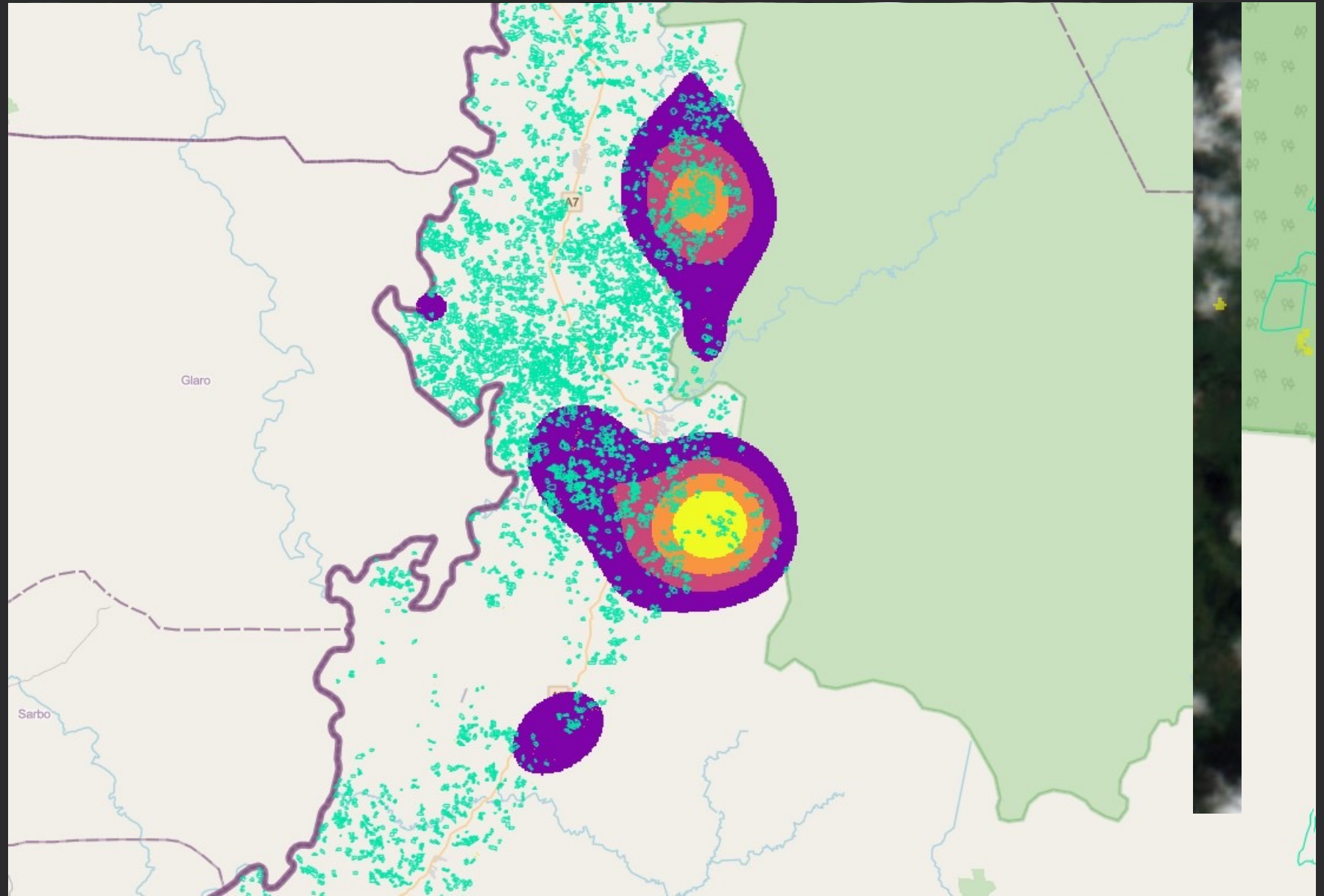


# Outputs



Ongoing Monitoring  
+ Verification

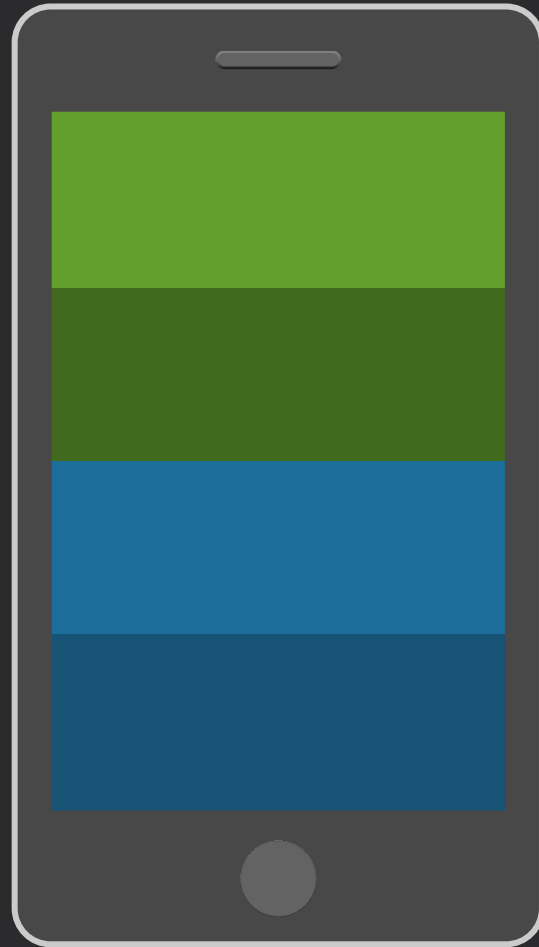
03 VERIFY



# Outputs



04 REPORT



User Friendly



Do not need to be a specialist

Responsive



Generate the answers

Decision Support



Transparency and validation

Customisable



Creating a partnership



# Use case

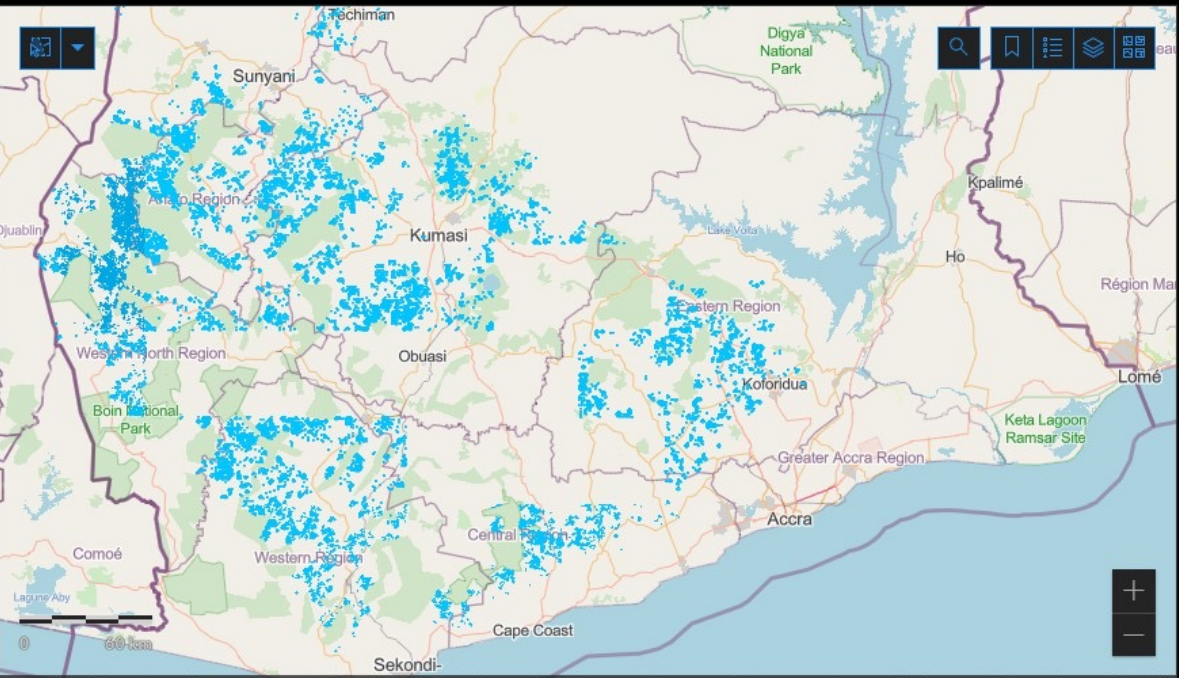


- Global monitoring application
- Remote sensing
  - 3<sup>rd</sup> Party
  - Sentinel-2
  - Planet Dove
- ESRI backend
- Cloud processing
- Deforestation detection
  - Not country level but based on field level

# Use case

## Farm Information

- Warehouse : OBUASI B DISTRICT**  
Farm Code : AS/054/OBB/61-033 Lat : 6.166880 Lon : -1.784338
- Warehouse : ASSIN FOSO B DISTRICT**  
Farm Code : CR/054/AFB/11-012 Lat : 5.450893 Lon : -1.121829
- Warehouse : ASSIN FOSO B DISTRICT**  
Farm Code : CR/054/AFB/11-012 Lat : 5.450965 Lon : -1.123286
- Warehouse : ASHANTI BEKWAI B DISTRICT**  
Farm Code : AS/054/4B/26-063 Lat : 6.646865 Lon : -1.436525
- Warehouse : NEW EDUBIASE C DISTRICT**  
Farm Code : AS/054/NEC/50-008 Lat : 6.096666 Lon : -1.244230
- Warehouse : NEW EDUBIASE C DISTRICT**  
Farm Code : AS/054/NEC/50-008 Lat : 6.096770 Lon : -1.246141
- Warehouse : WASSA AKROPONG DISTRICT**

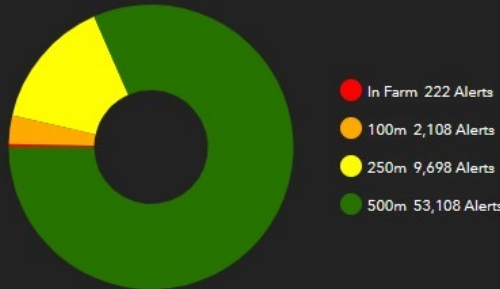


Map data © OpenStreetMap contributors, Microsoft, Facebook, Inc. and its affiliates, Esri Community Maps contributors, Map layer by Esri Powered by Esri

## Farms with Alerts

**222**  
7.7 Ha

## Disturbance Alerts vs Farm Distance



## Farm Disturbance Information

- Date : 18/03/2023, 23:00  
Zone : 500m  
Alert Source : RADD-3  
Lat : 6.48, Long : -2.91
- Date : 18/03/2023, 23:00  
Zone : 500m  
Alert Source : RADD-3  
Lat : 6.48, Long : -2.91
- Date : 18/03/2023, 23:00  
Zone : 500m  
Alert Source : RADD-3  
Lat : 6.37, Long : -2.76

## Disturbance Alerts

- Date: 13/03/2022, 01:00  
Area: 0.152558 ha  
Source: GLAD-L  
Farm:  
Forest Type:
- Date: 13/03/2022, 01:00  
Area: 0.076279 ha  
Source: GLAD-L  
Farm:  
Forest Type:
- Date: 13/03/2022, 01:00  
Area: 0.076279 ha  
Source: GLAD-L  
Farm:  
Forest Type:
- Date: 13/03/2022, 01:00  
Area: 0.076283 ha  
Source: GLAD-L

## Disturbance Tracker - Total Area Ha



Disturbance Total Area Ha | Disturbance Total Alerts | Tree Cover Loss - Area





**Thank you**  
**Michael Breetzke**  
**Michael@swiftgeospatial.solutions**