

K&C Phase 4 – Status report

TransparentForests

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sarmap

TransparentForests – The team

- Charles Crosthwaite Eyre – Project Manager & Evaluation
- Tim Synnott – FSC consultant
- sarmap – EO component
- Lutra Consulting – GIS component
- The Nottingham Geospatial Institute – Navigation and tracking system
- Environmental System – System validation
- Secure Dimension – System security and integrity

Project outline and objectives

The main objectives of this work are

- **Scientific** – To demonstrate the benefit of the synergetic use of multi-temporal multi-frequency (SAR in particular) data for forest certification purposes in different biomes;
- **Service** – To set up an operational system for forest certification purposes.

On Forest Certification – The 10 principles

Principle 1: Compliance with laws and FSC Principles

Principle 2: Tenure and use rights and responsibilities

Principle 3: Indigenous peoples' rights

Principle 4: Community relations and worker's rights

Principle 5: Benefits from the forest

Principle 6: Environmental impact

Principle 7: Management plan

Principle 8: Monitoring and assessment

Principle 9: Maintenance of high conservation value forests

Principle 10: Plantations

EO Products

Thematic product (LCM/LCC)

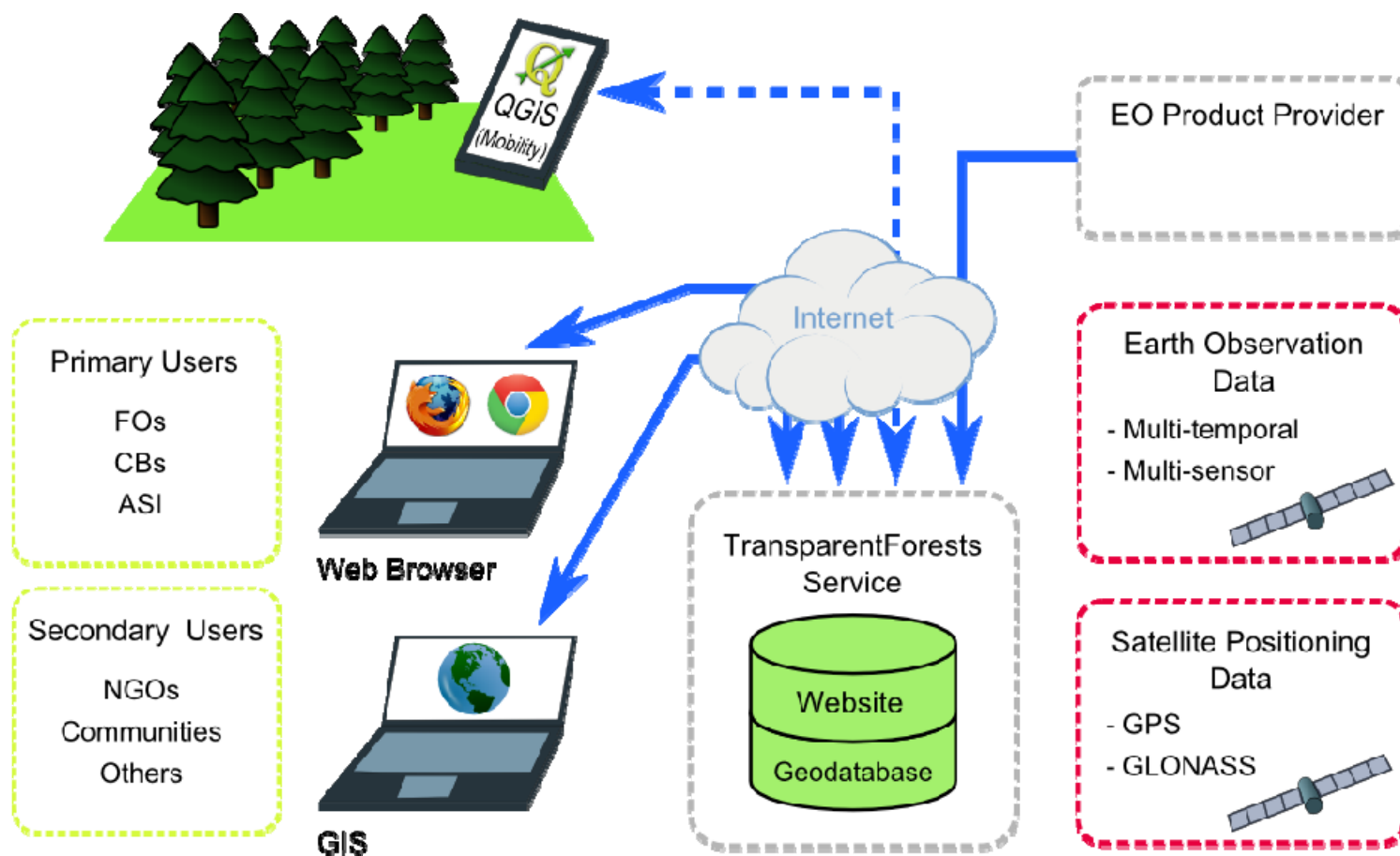
- Where
 - When, How much, Type
- within a given period, typically before auditing.

Biophysical product

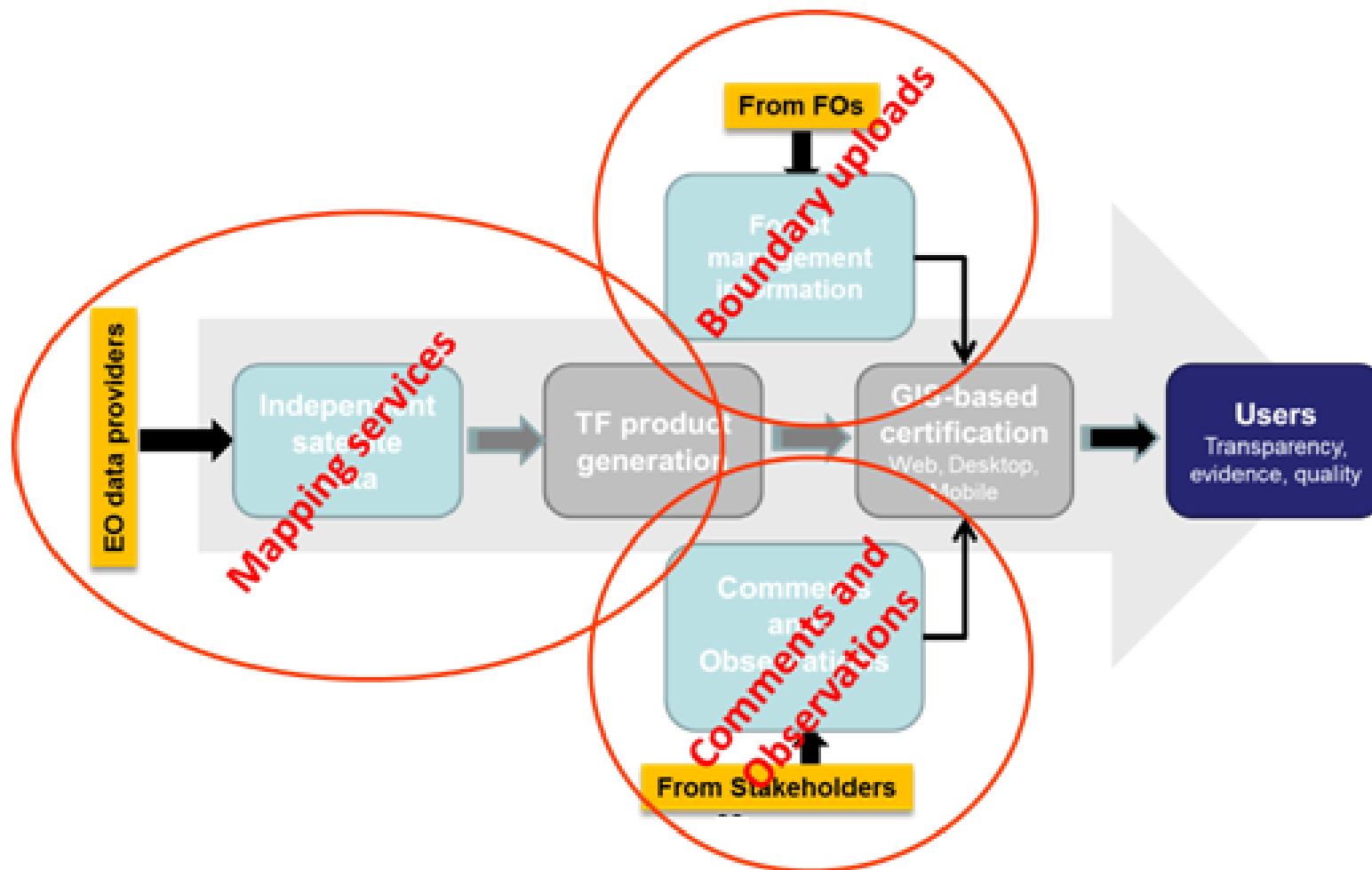
- Timber Volume (in primis in forest plantations)

Digital Surface Model (< 10m)

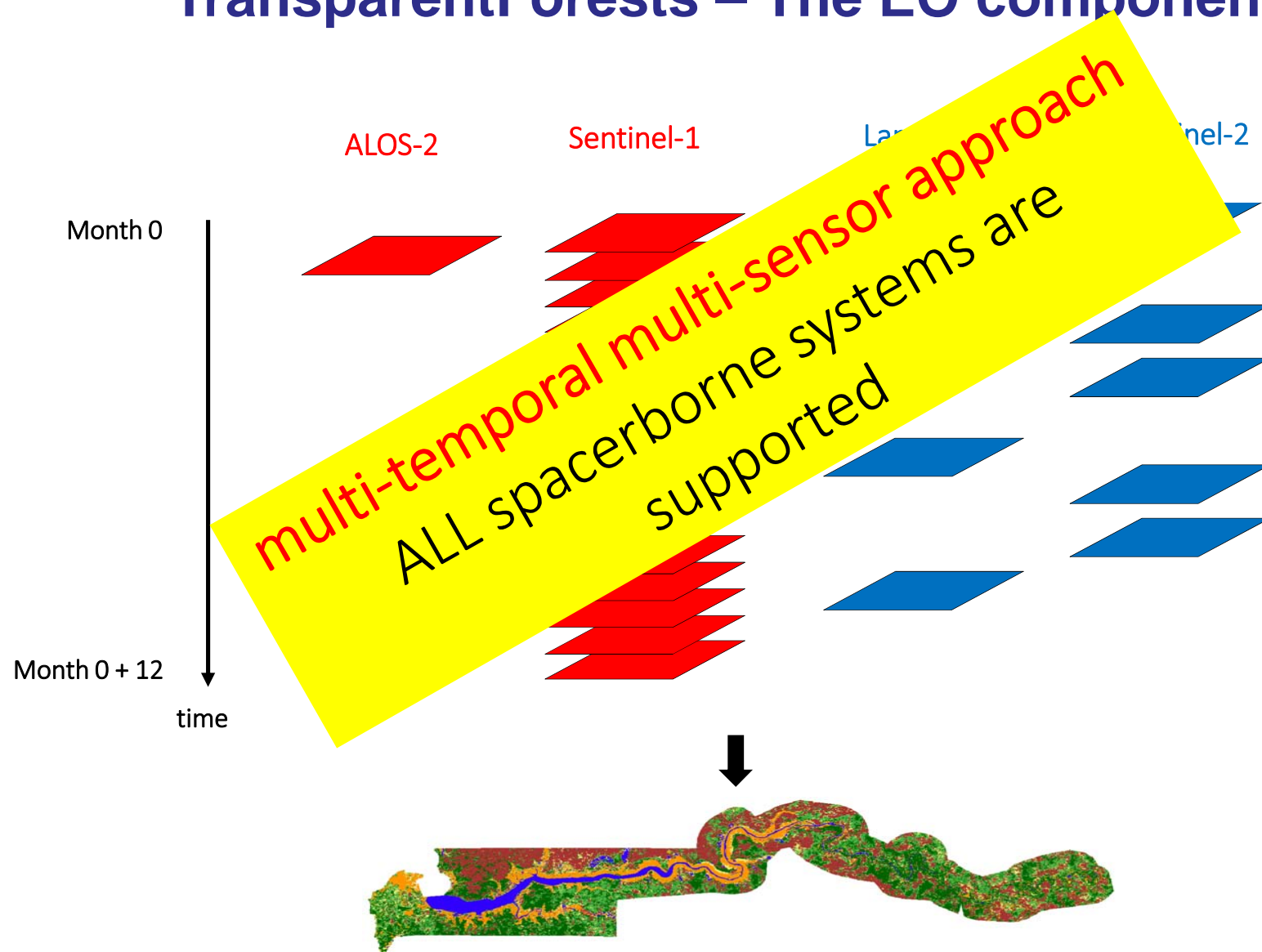
TransparentForests – The service



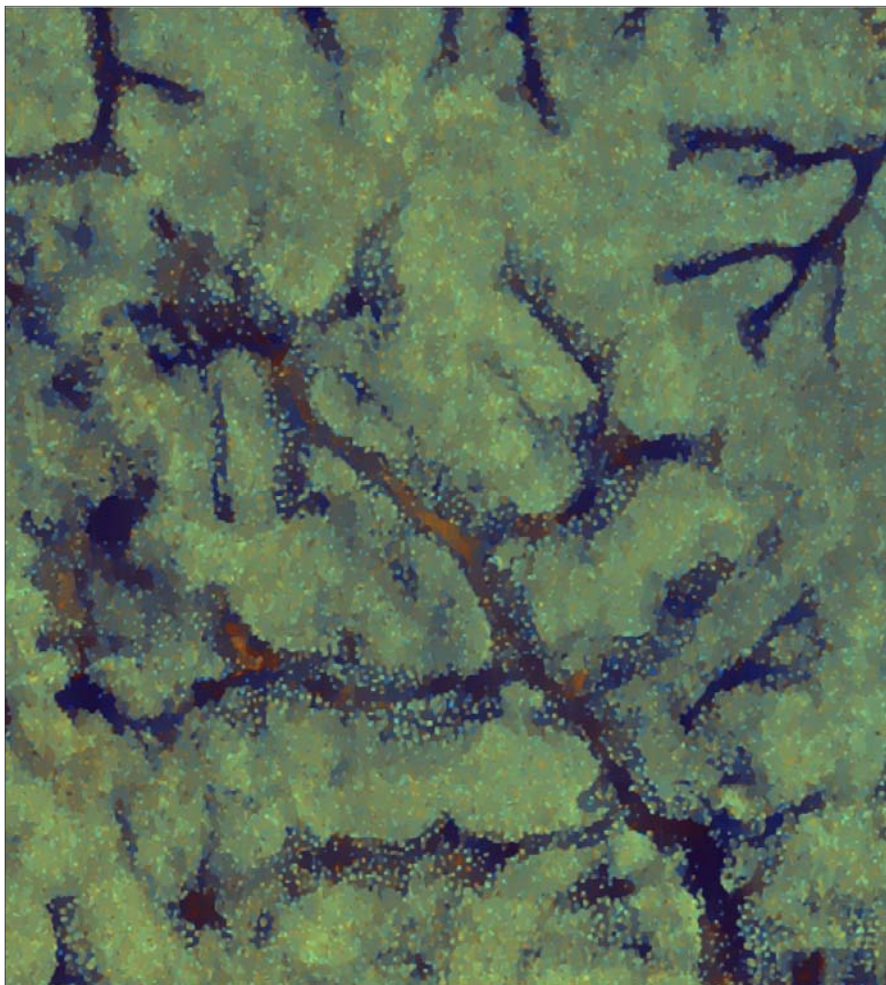
TransparentForests – The service



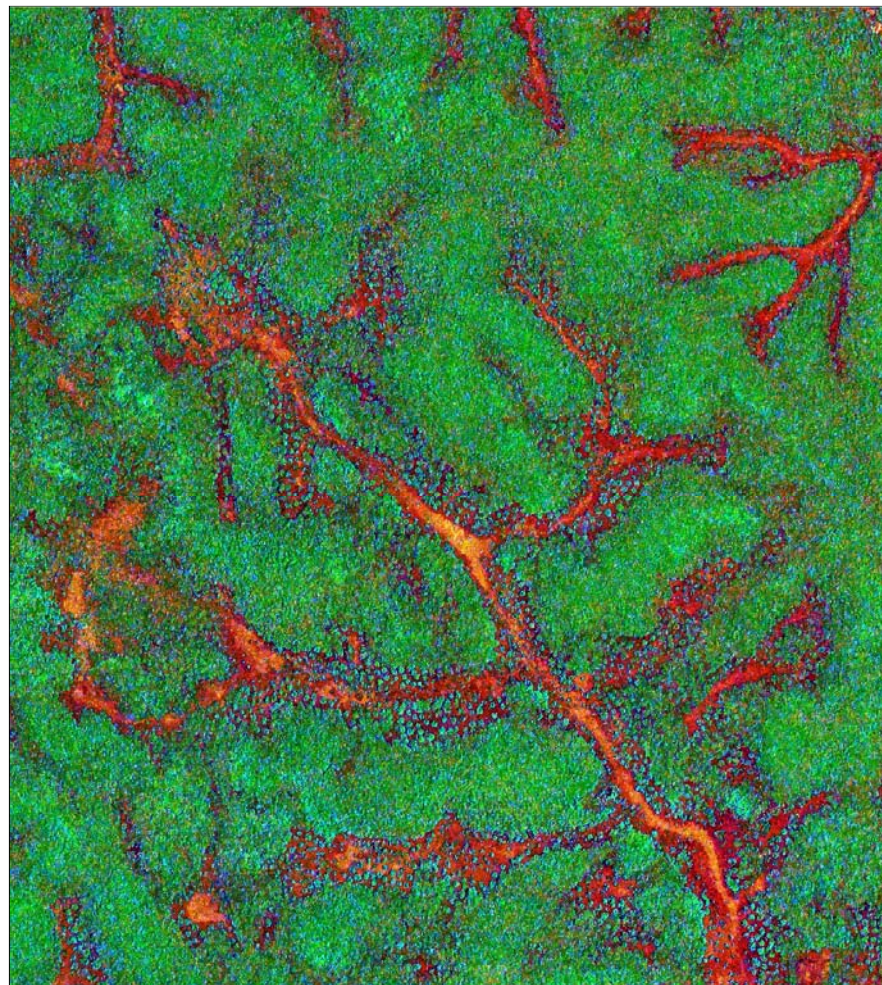
TransparentForests – The EO component



Multi-year vs. single date



Multi-year PALSAR-1 HH-HV (15m)



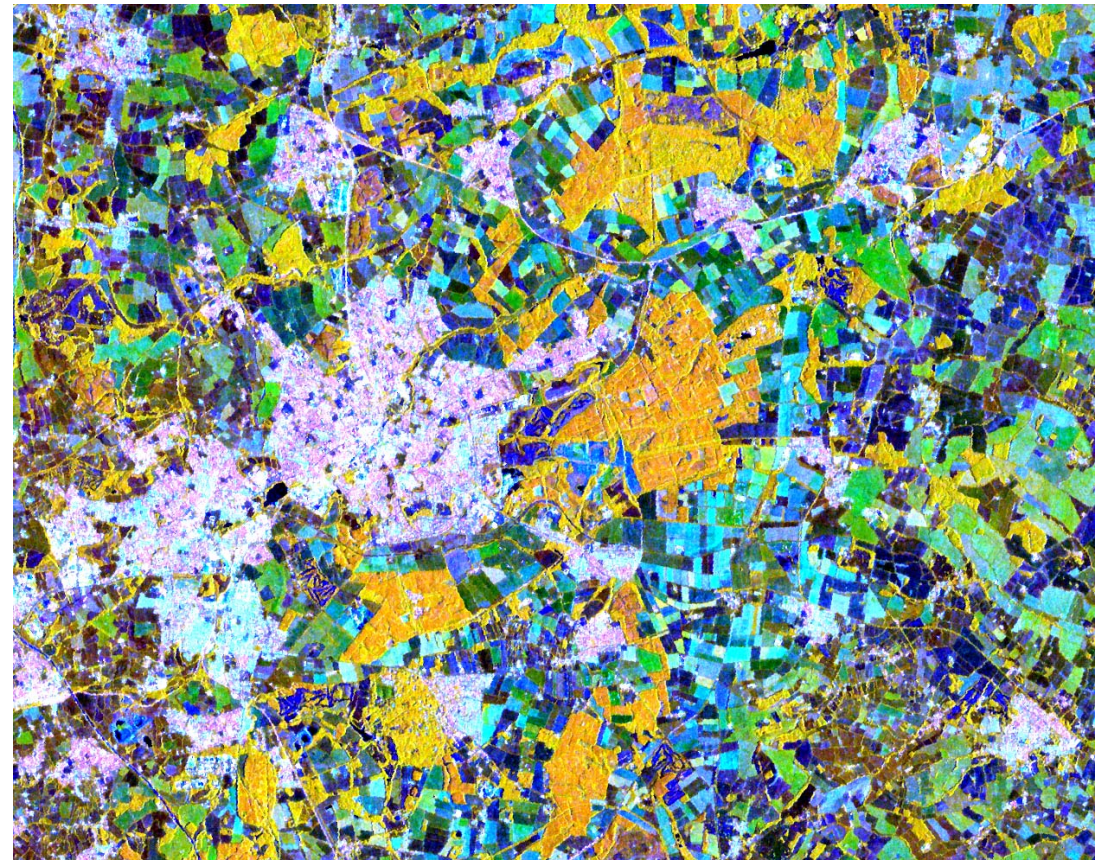
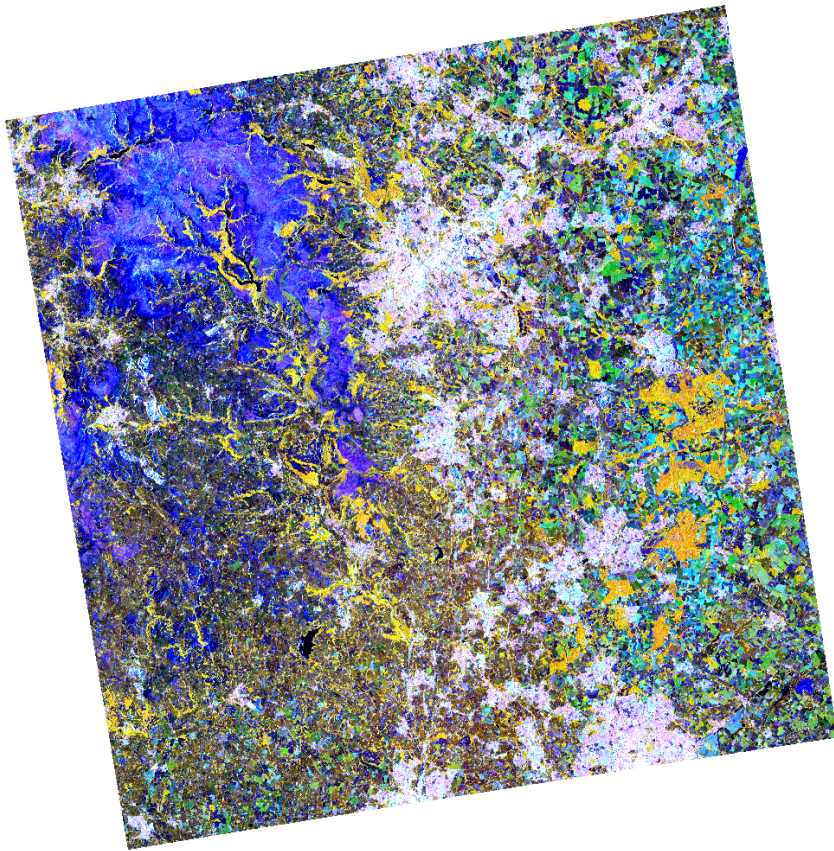
1 day InSAR CSK StripMap (3m)

Project areas

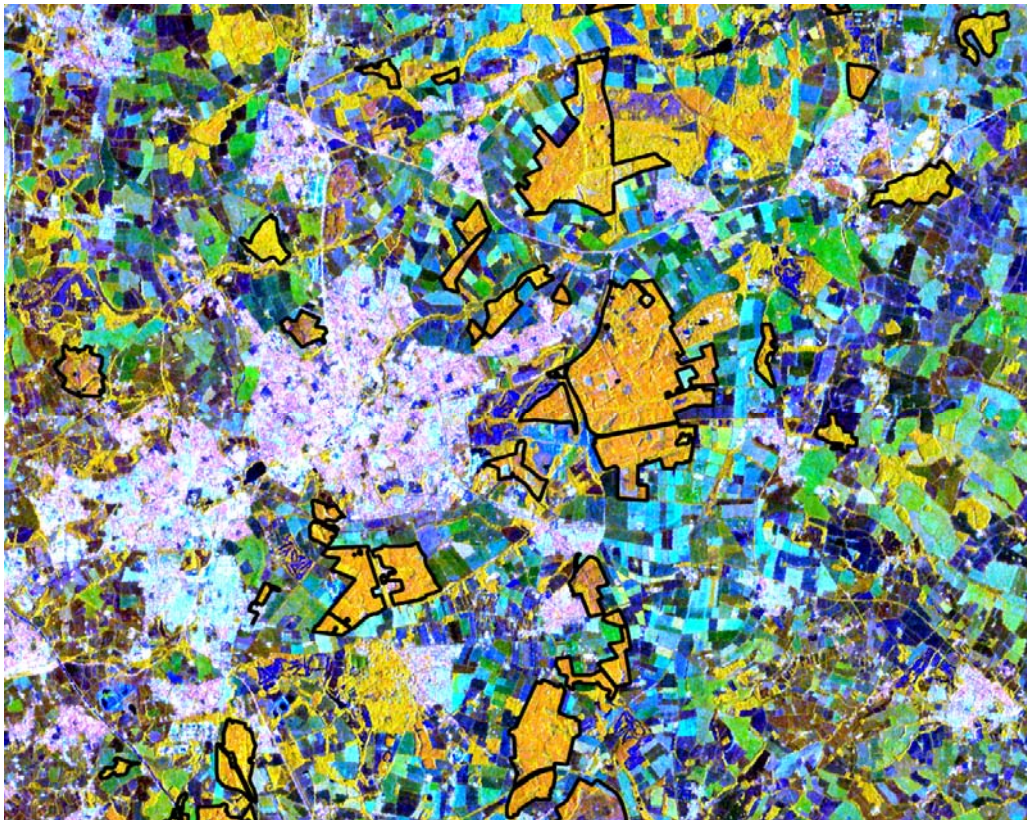
Demonstration areas in the following countries:

- **United Kingdom**
- **United States**
- **Mexico**
- **Russia**
- **South Africa**
- **Canada**
- **Sweden**
- **Cambodia**

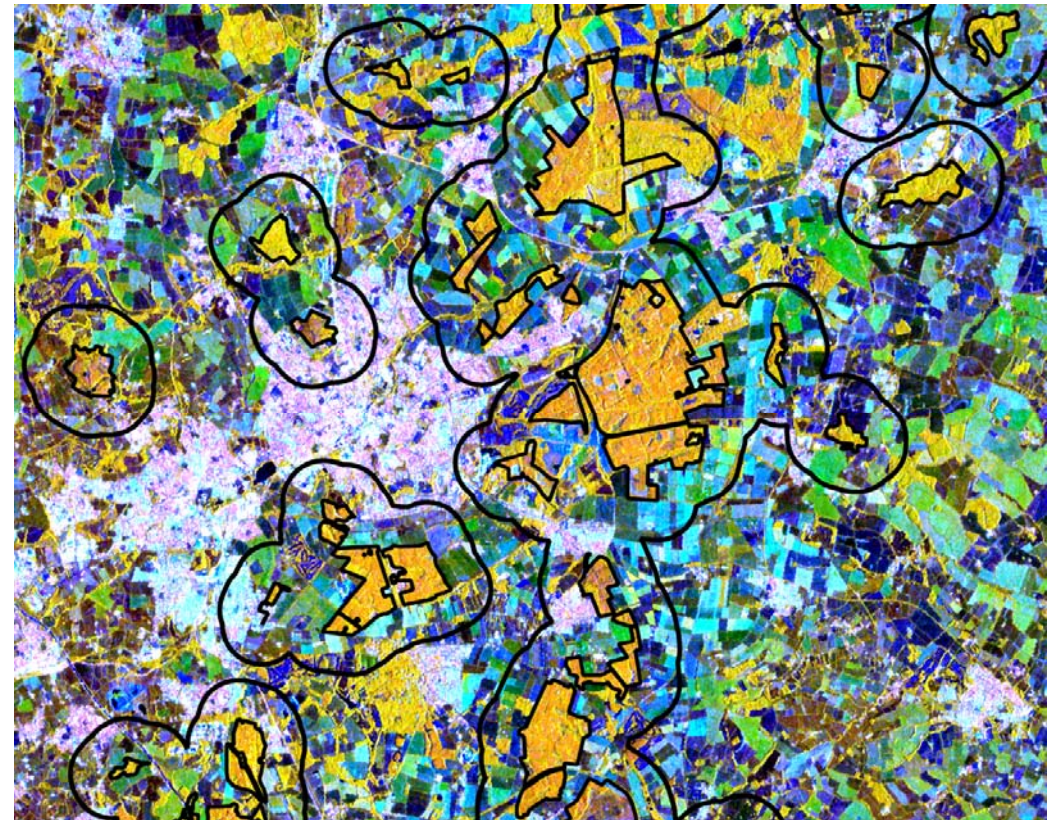
Some Examples – UK



Some Examples – UK

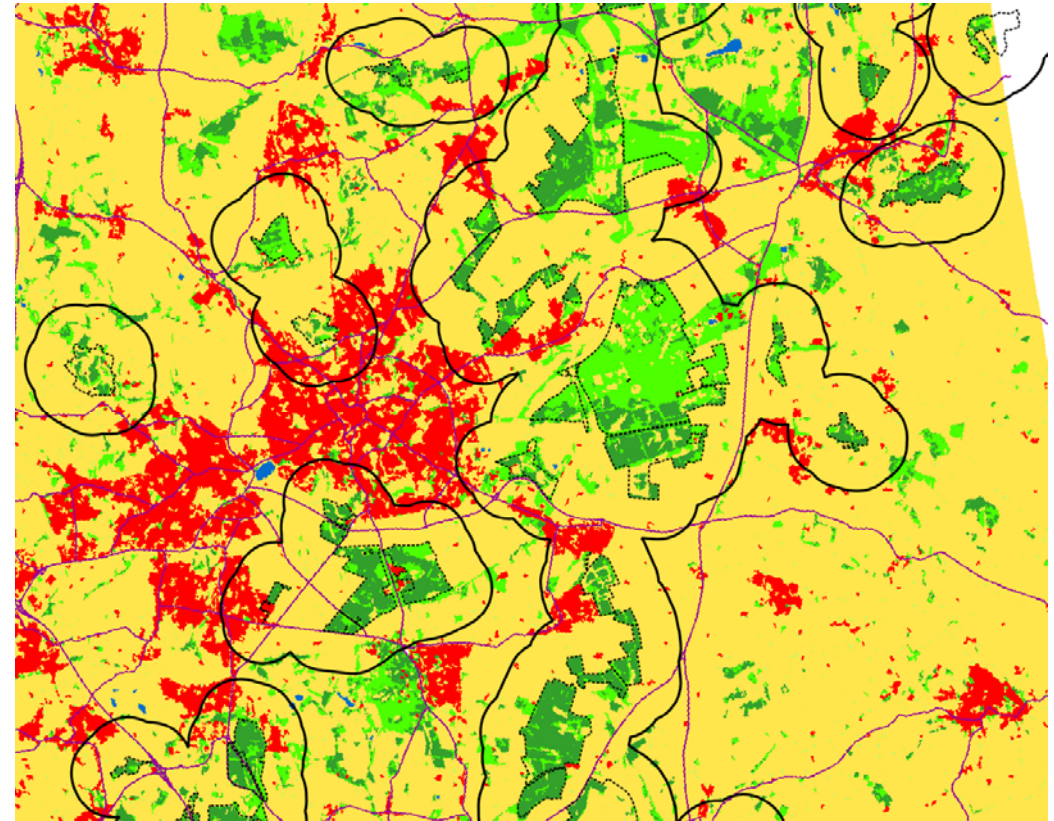
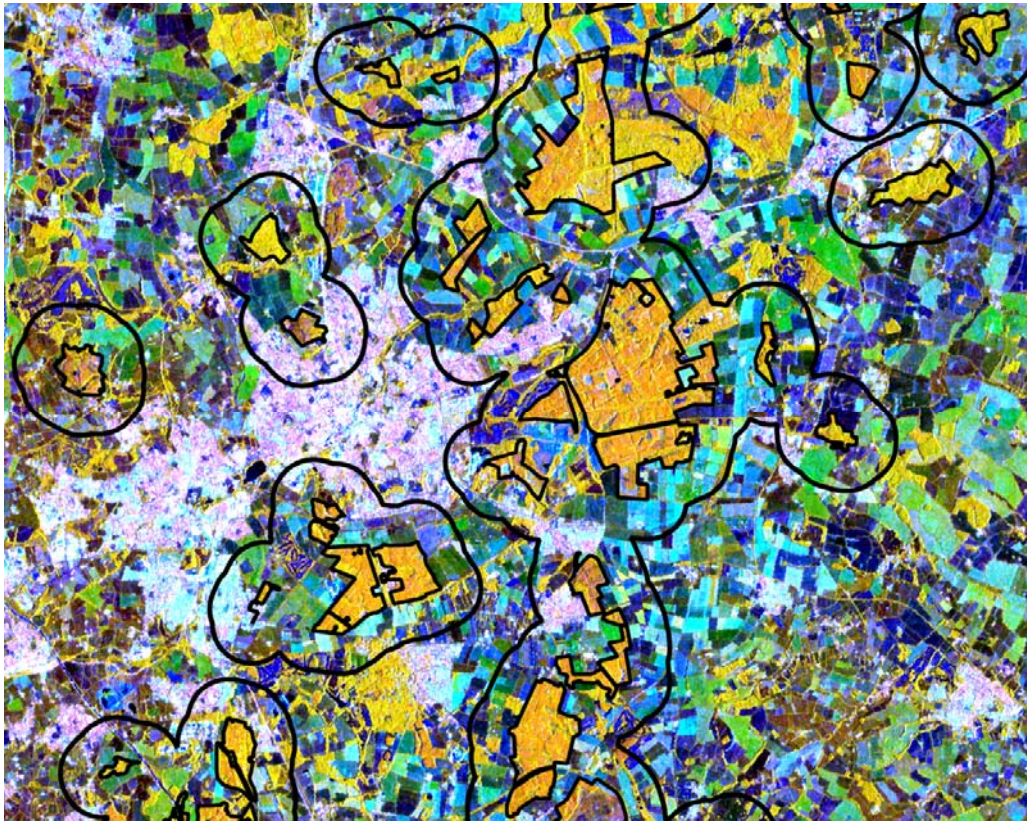


including forest boundaries

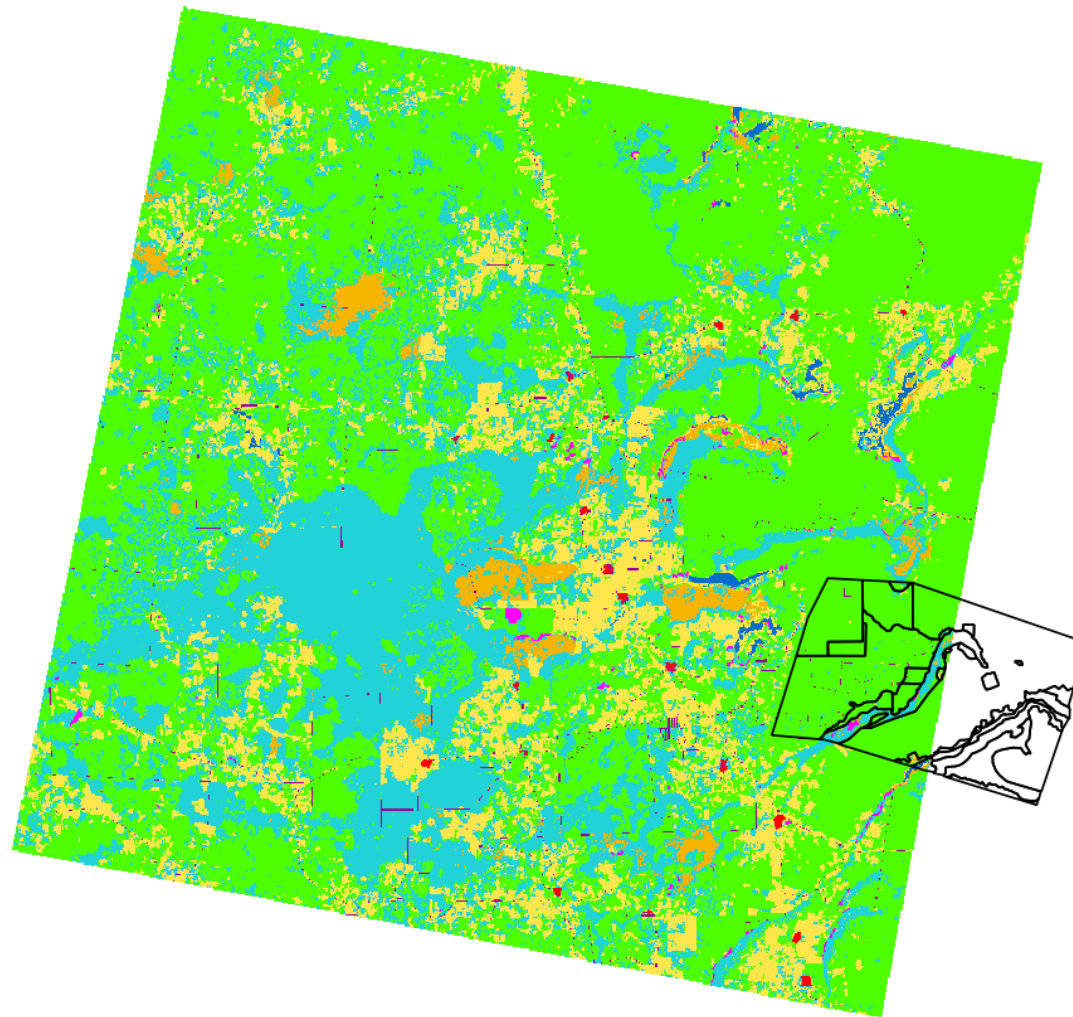


including forest boundaries buffered at 1km

Some Examples – UK

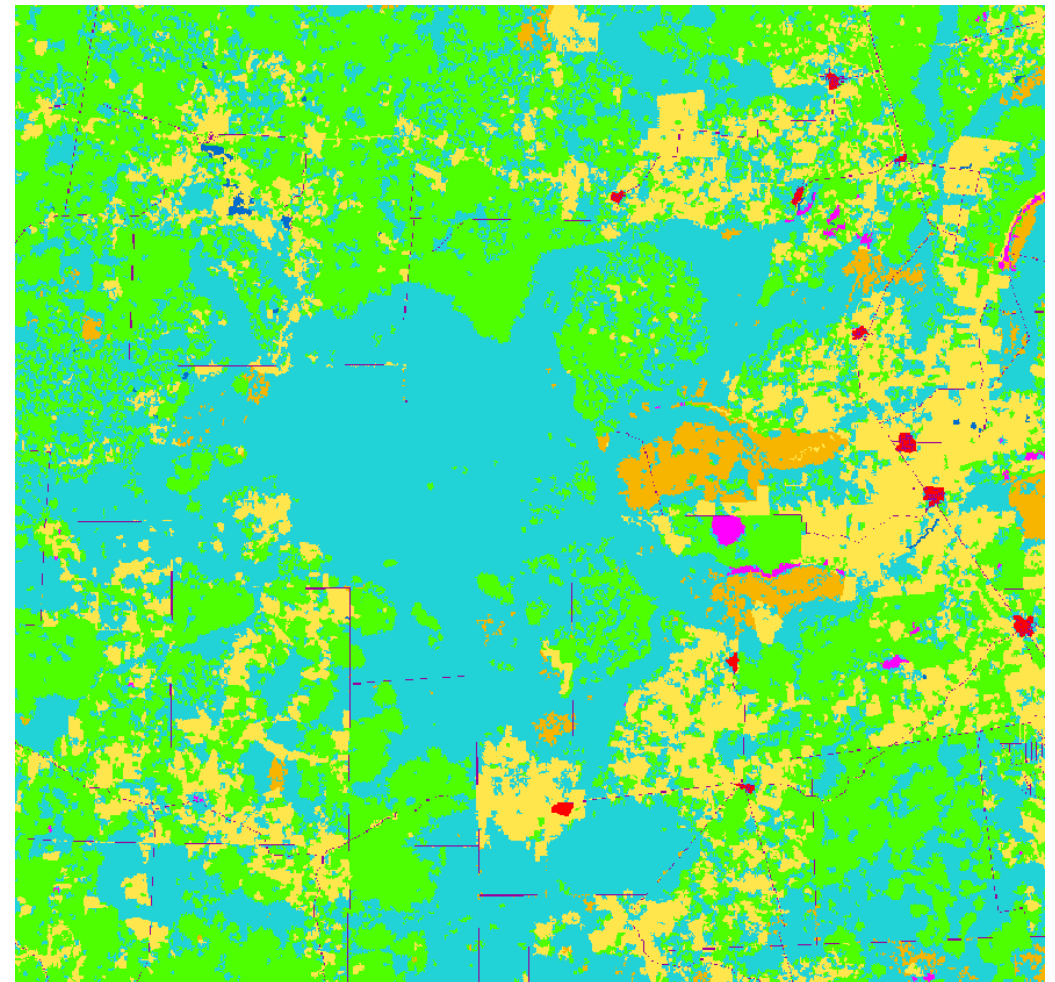
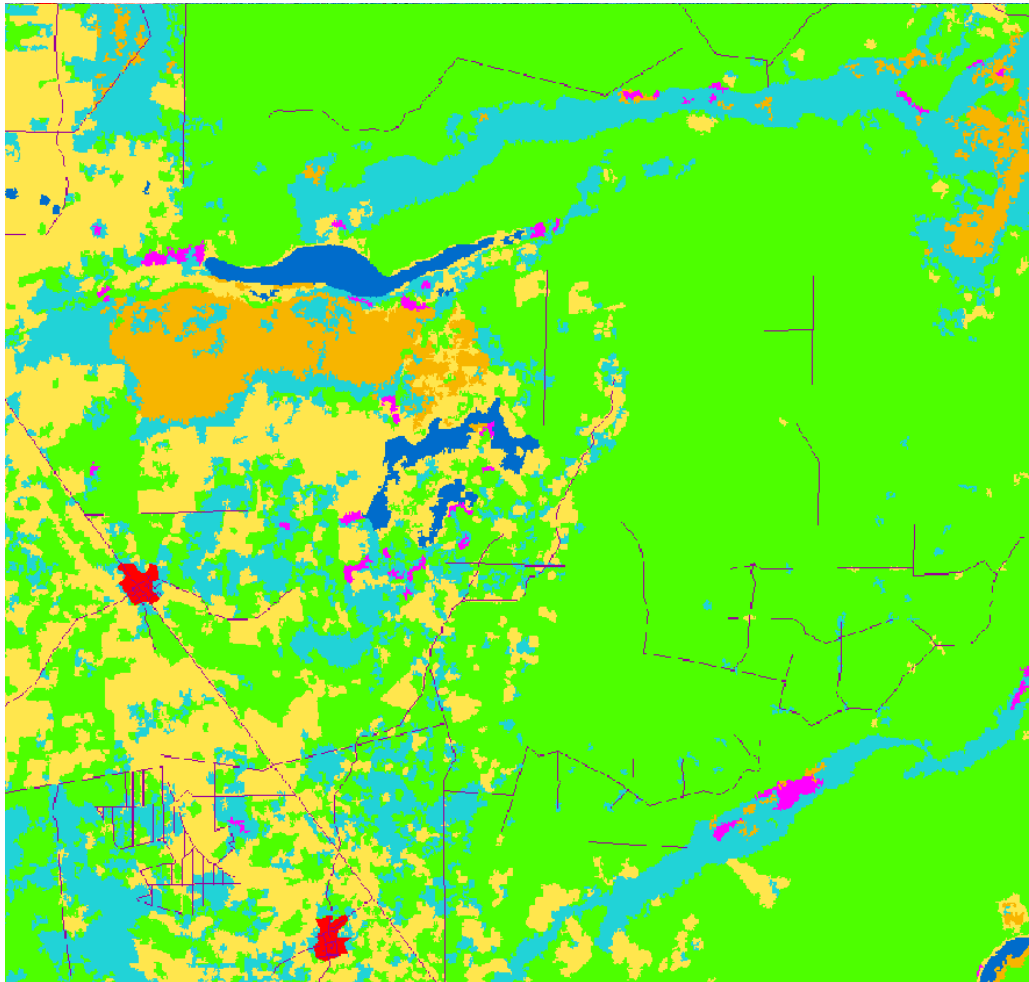


Some Examples – Mexico



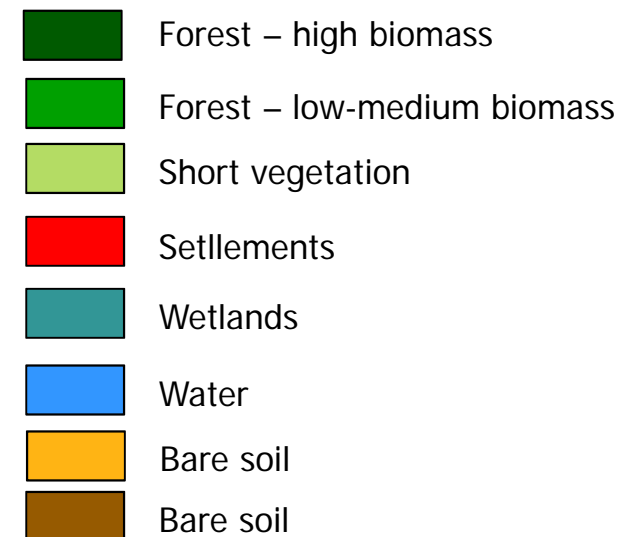
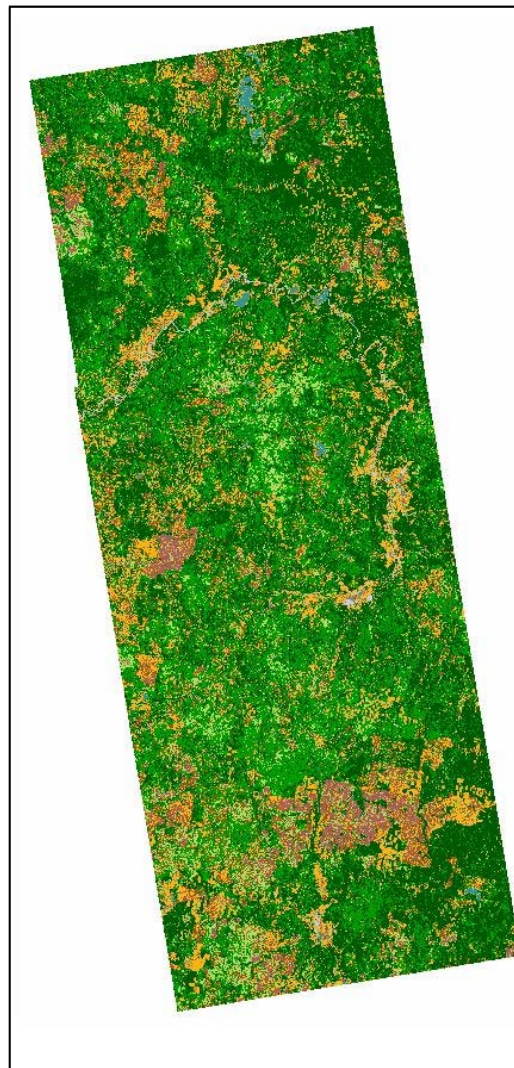
- Natural forest
- Agriculture, Bare soil, grassland
- Settlement
- Wet shrubland
- Wetlands trees
- Swamp forest

Some Examples – Mexico

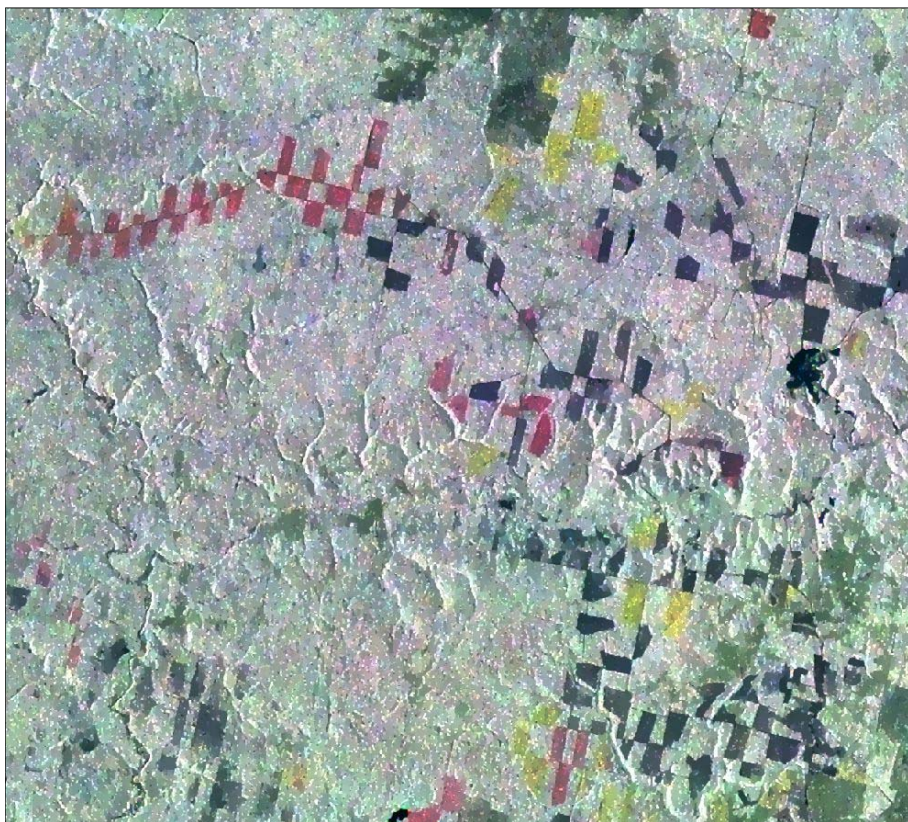


Wet shrubland Wetlands trees Swamp forest

Some Examples – Russia



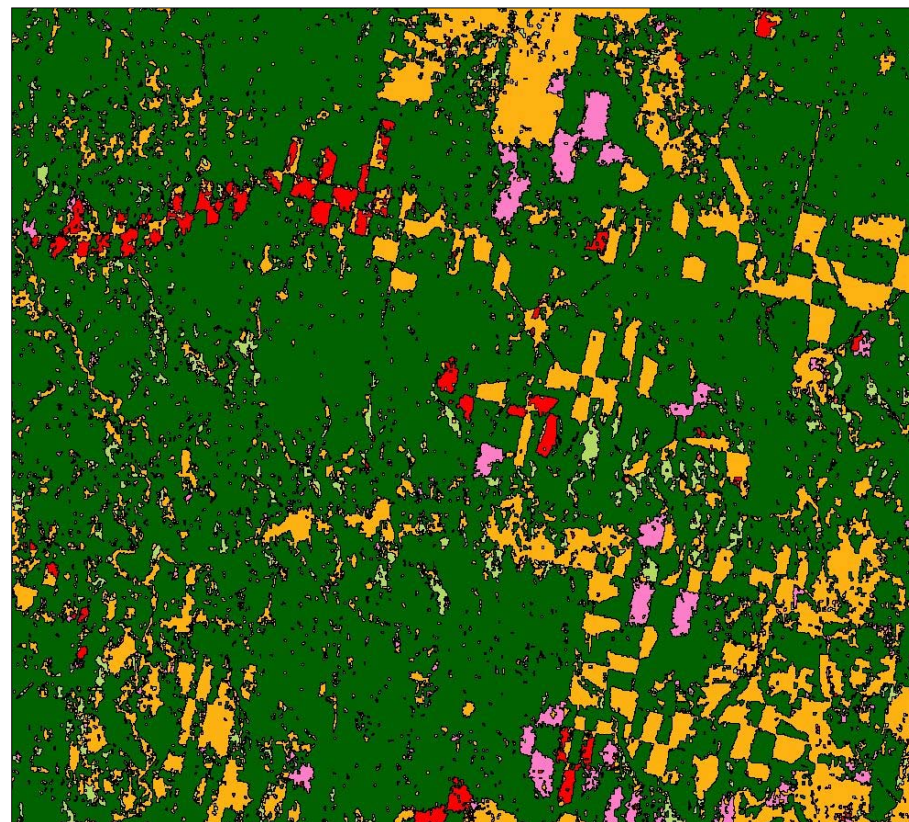
Some Examples – Russia



HV intensity 2007

HH intensity 2008

HH intensity 2009

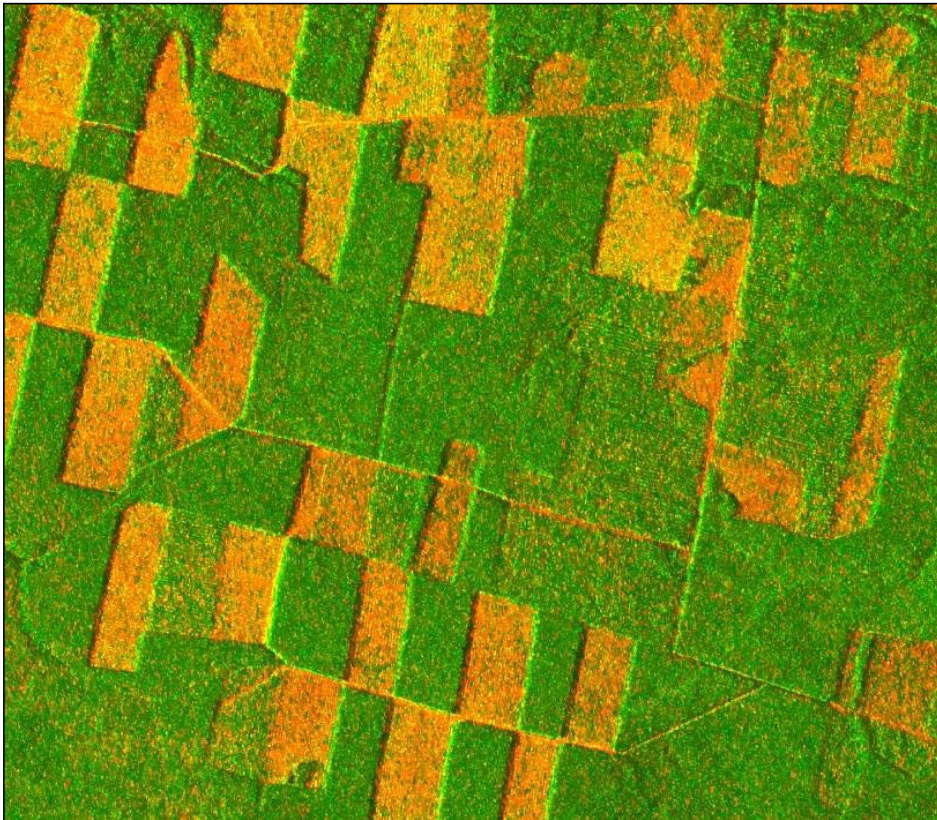


clear fell before 2007

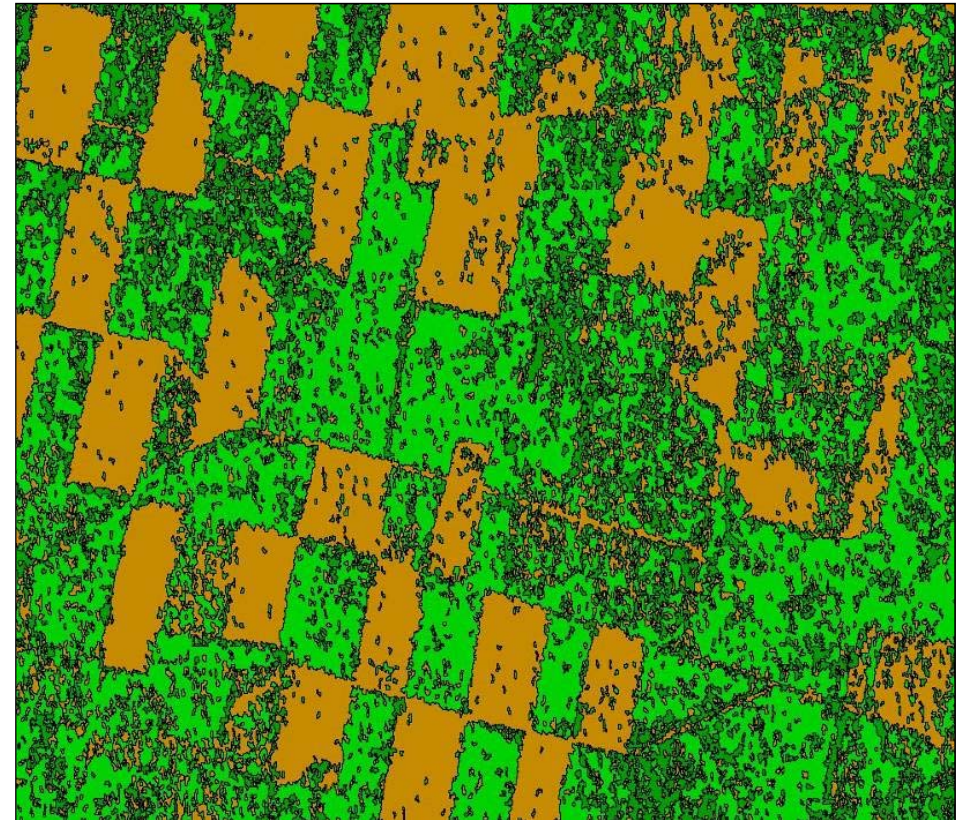
clear fell 2007-2008

clear fell 2008-2009

Some Examples – Russia



1 day HH coherence
mean HH intensity
HH difference



forest
bare soil

Some Examples – South Africa



forest - high biomass
forest - low biomass
clear fell
bare soil – stable
bare soil - rough to flat
bare soil - flat to rough

Project milestones

Following project milestones are planned:

- TF product definition – Q1 2012 - Q2 2013
- TF implementation – Q3 2013 - Q3 2015
- TF demonstration – Q4 2015 - Q4 2016
- TF delivery – 2017-2019

Deliverables

In the demonstration areas following information will be provided:

- **Geo-referenced field photos – jpg format;**
- **Bio-physical forest information – shape file;**
- **Geocoded and calibrated EO products – GeoTIF format;**
- **EO products – GeoTIF format.**

Conclusions

Temporal spectral descriptors are essential to capture land cover classes linked to forest certification. In particular,

- the selection of the appropriate time period is crucial;
- the temporal combination of wavelengths and polarizations enhances the level of detail and product's reliability;
- the use of temporal descriptors derived from multi-annual, annual, and seasonal time series data provides, from a forest perspective, complementary information;
- temporal spectral descriptors have a forest meaning meaning, hence they should be used in knowledge based classifiers.

Publication

C.C. Eyre, T. Synnott, F. Holecz, P. Wells, S. Keyworth, R. Ogundipe, P. Miettinen, H. J. Droste, G. Origgi, L. Oleggini, F. Collivignarelli, M. Barbieri, L. Gatti, S. Razmjooei, A. Seabrook, H. Martins, M. Dobias, J. Williams, A. Matheus, *TransparentForests*, 17th Annual World Bank Conference on Land and Poverty, Washington DC, March 2016.