

Foto: Gerd Ostermann



EEB Conference – Actions for Nature – Getting Europe on track to meet its 2020 targets

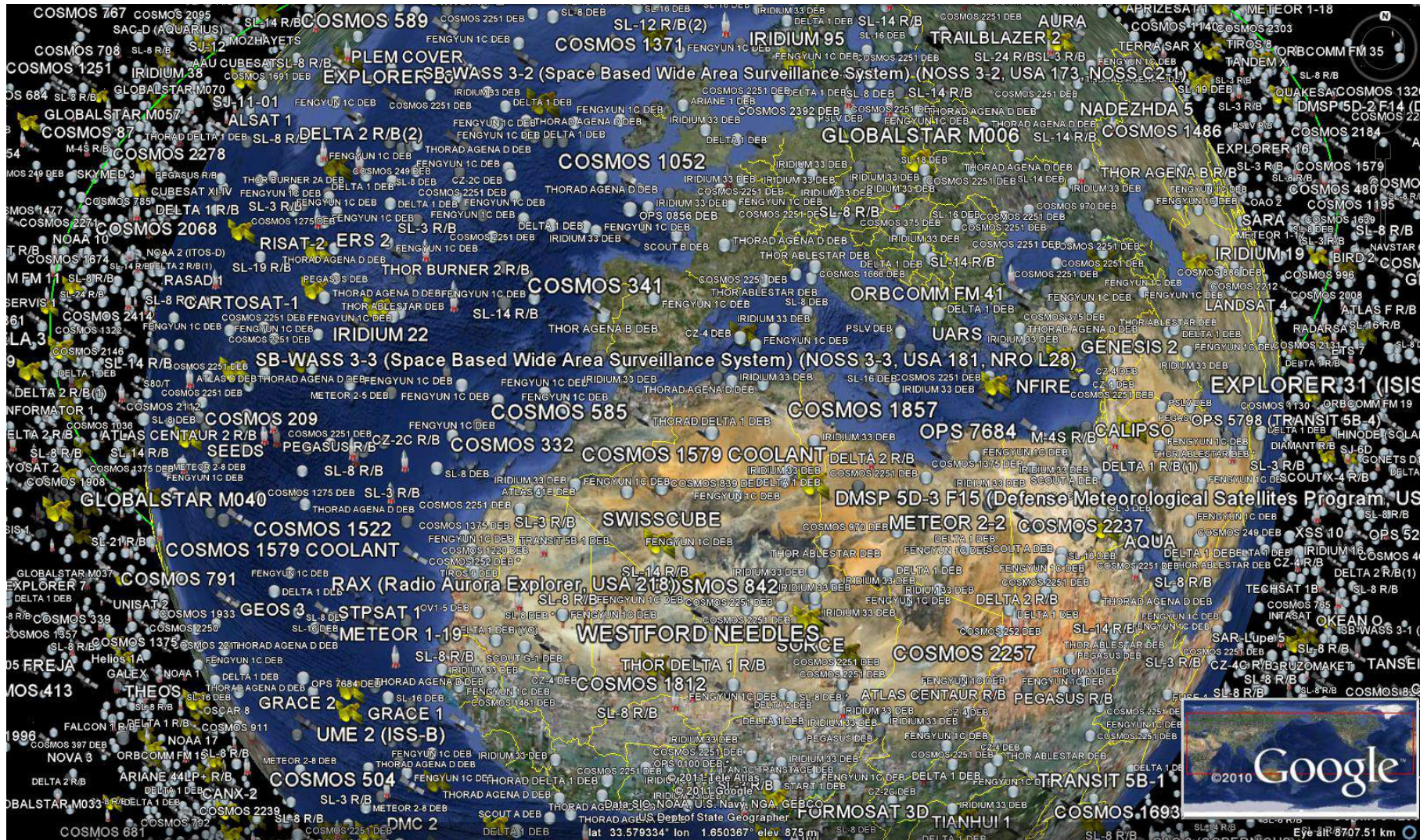
## The use of satellite imagery and remote sensing for better enforcement

Mohammad Abdel-Razek

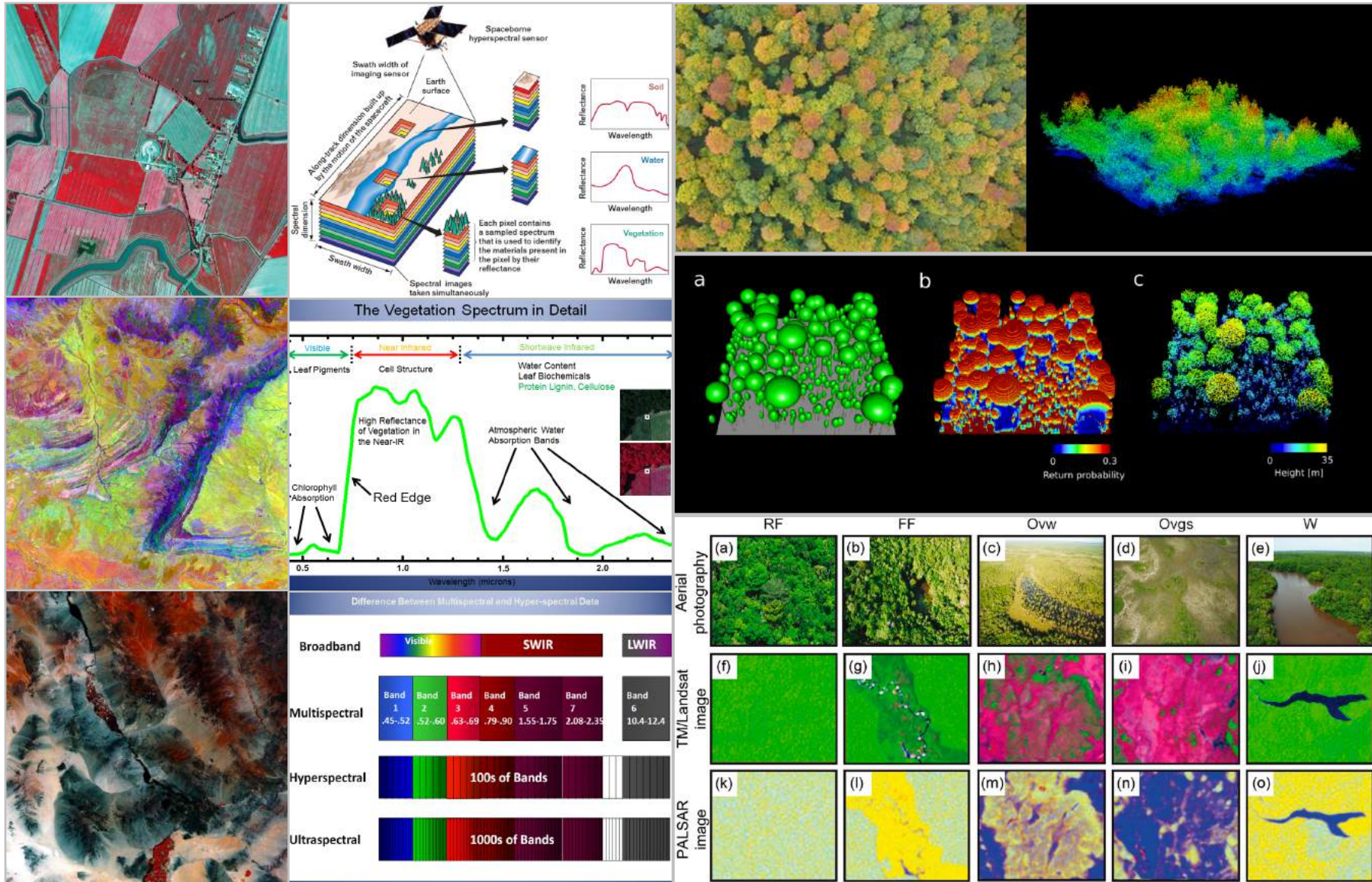
# Challenges

- **Protection** of ecosystems: Forests, grasslands, wetlands, peatlands, ...
  - **Implementation** and **enforcement** of legislation
  - Monitoring and **alert** systems
  - Provision of objective and clear **evidence**
  - **Access to information**
- ➔ A credible, fact-based, transparent **tool** to **implement** and **monitor** policies, to **detect illegal activities** and to provide **evidence** on this is required

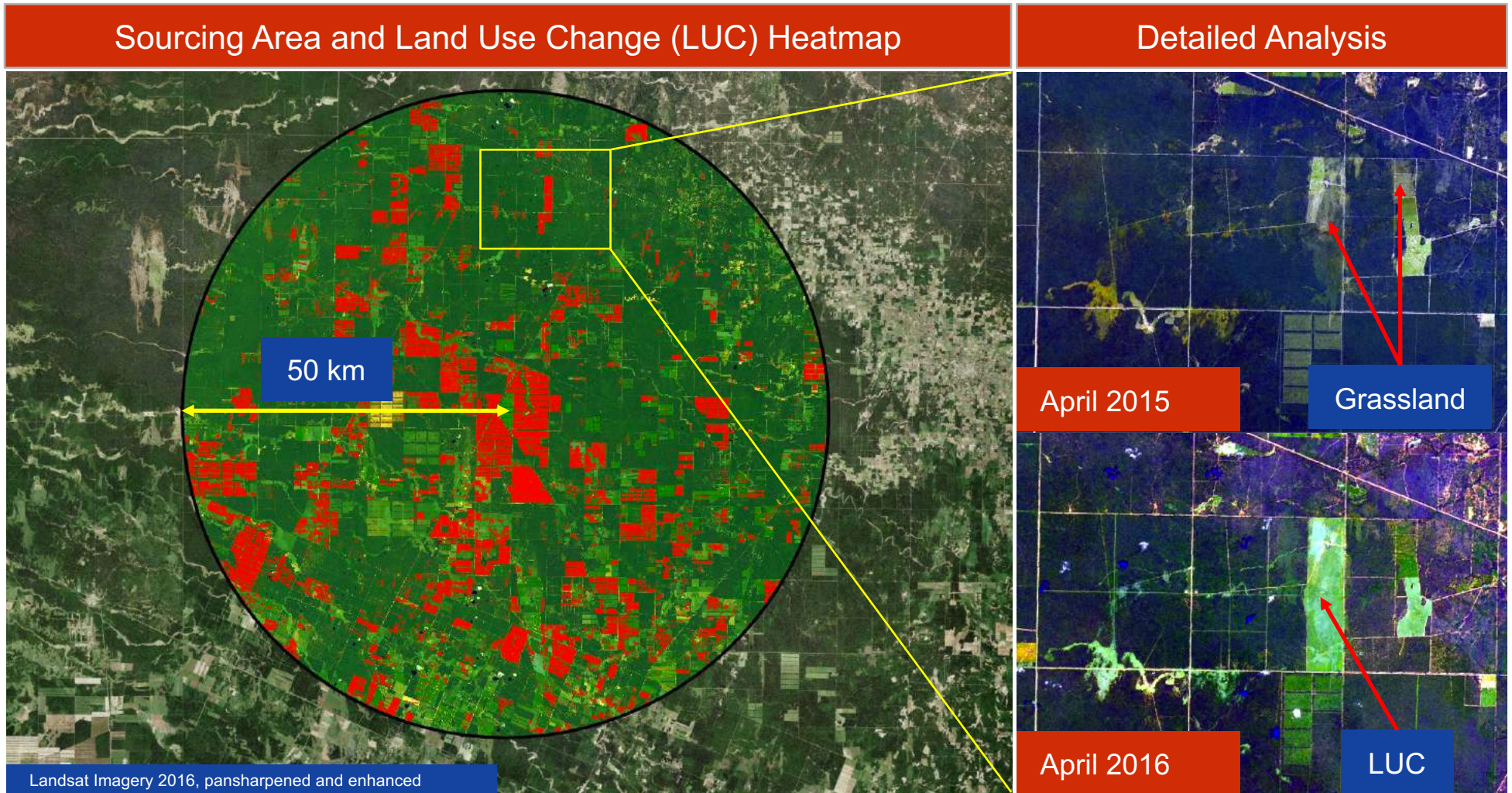
# Remote sensing is an excellent technology for detecting grassland conversion and monitoring grassland status, but?



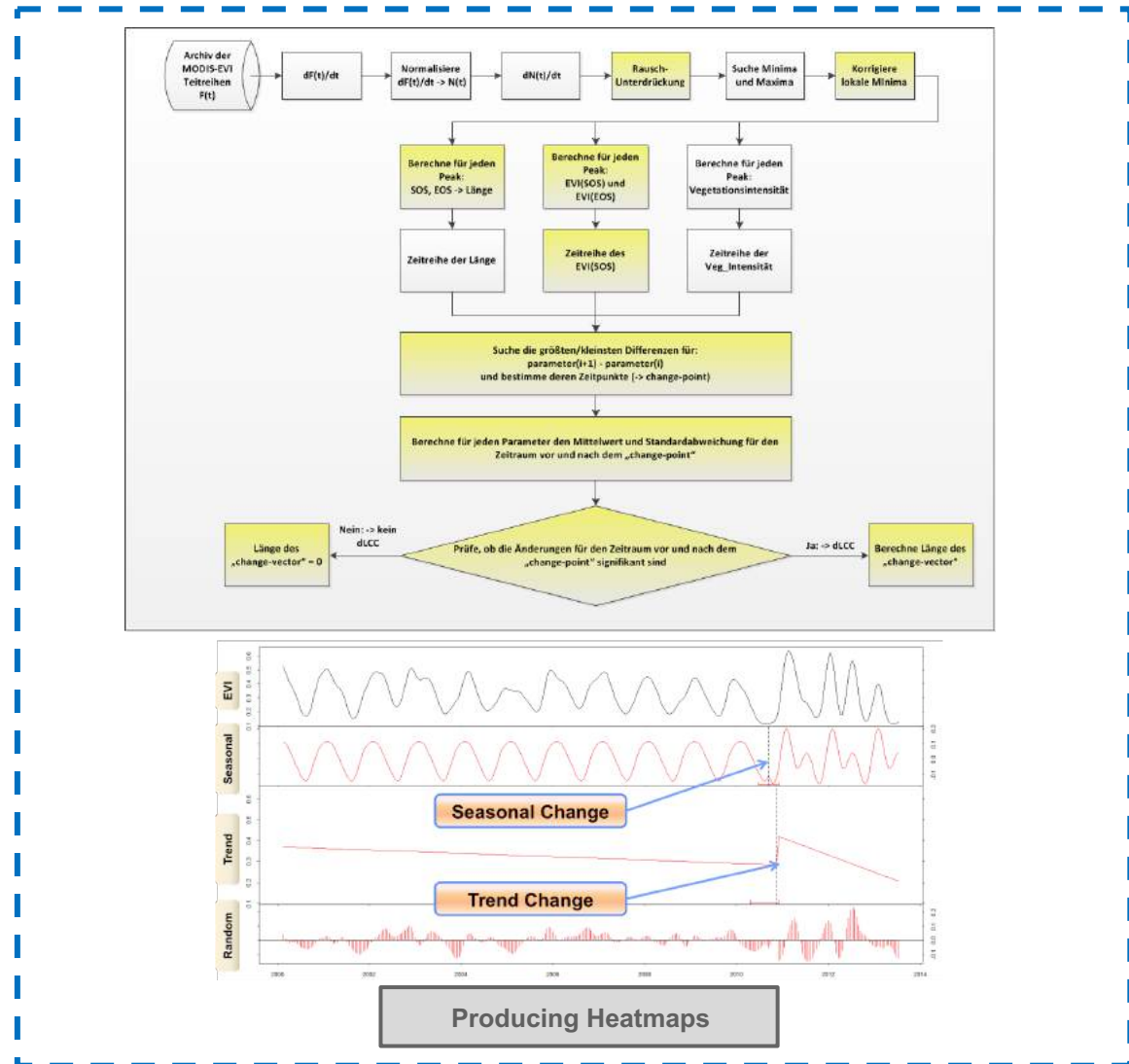
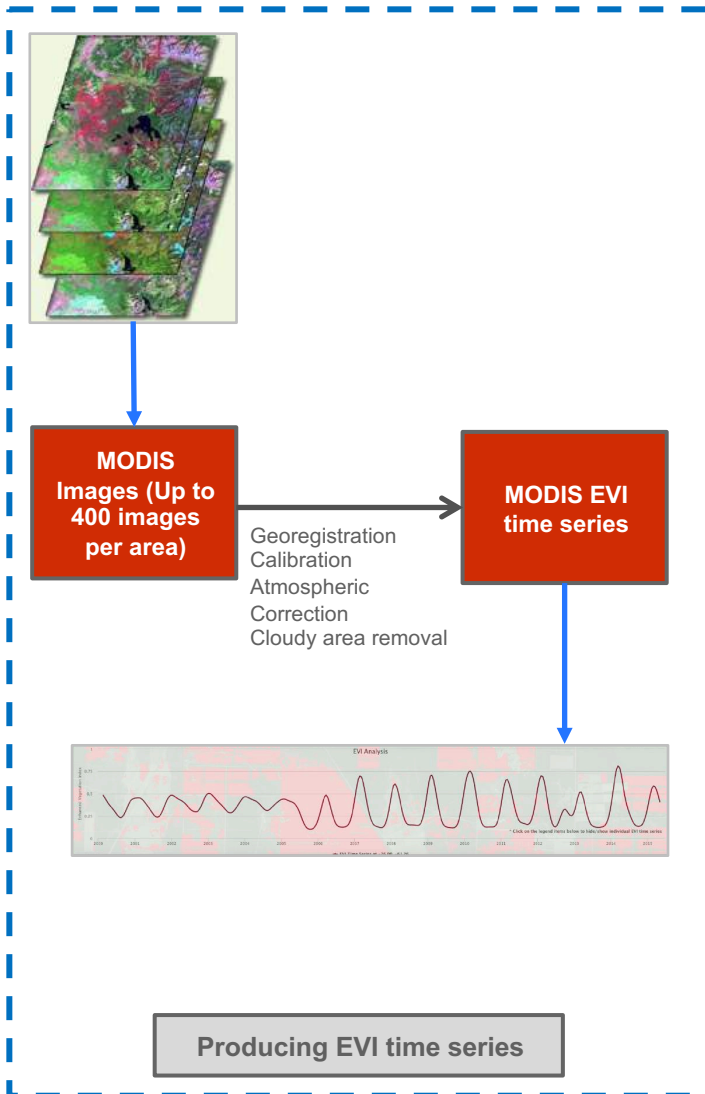
# Remote sensing imagery could be complicated



# GRAS Heatmaps show possible land use change in areas of interest, followed by a visual verification step



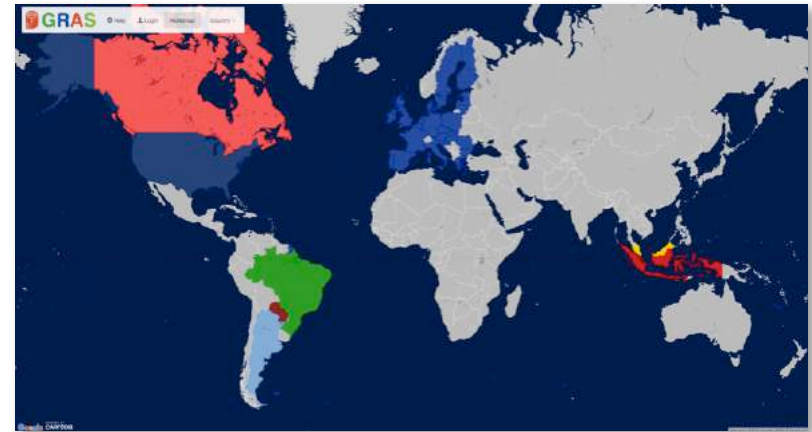
# GRAS summarizes hundreds of images into a single phenology graph. From the graph time and type of change is detectable



# The result is a web-tool providing geo-referenced sustainability information

## GRAS contributes to overcome implementation and enforcement challenges

- **Mapping of:**
  - Supply chains
  - Biodiversity and protection areas
  - Carbon stocks (e.g. peatlands)
  - **Land Use Change**
  - Social indices
- **Monitoring and alert system for LUC,**  
e.g. within Natura 2000 sites



The GRAS Tool currently covers 35 countries.  
More countries are available offline

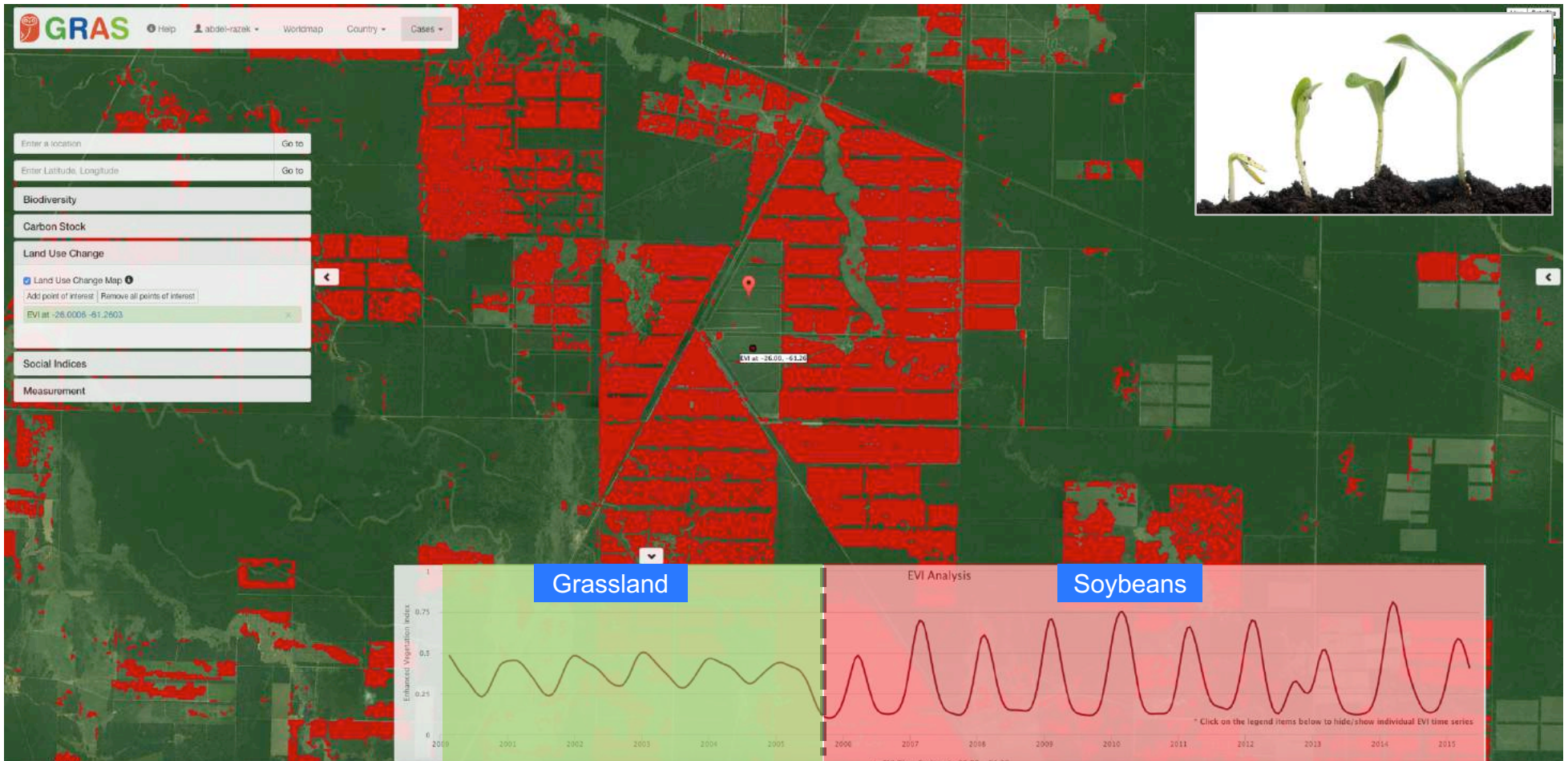
Gefördert durch:



aufgrund eines Beschlusses  
des Deutschen Bundestages

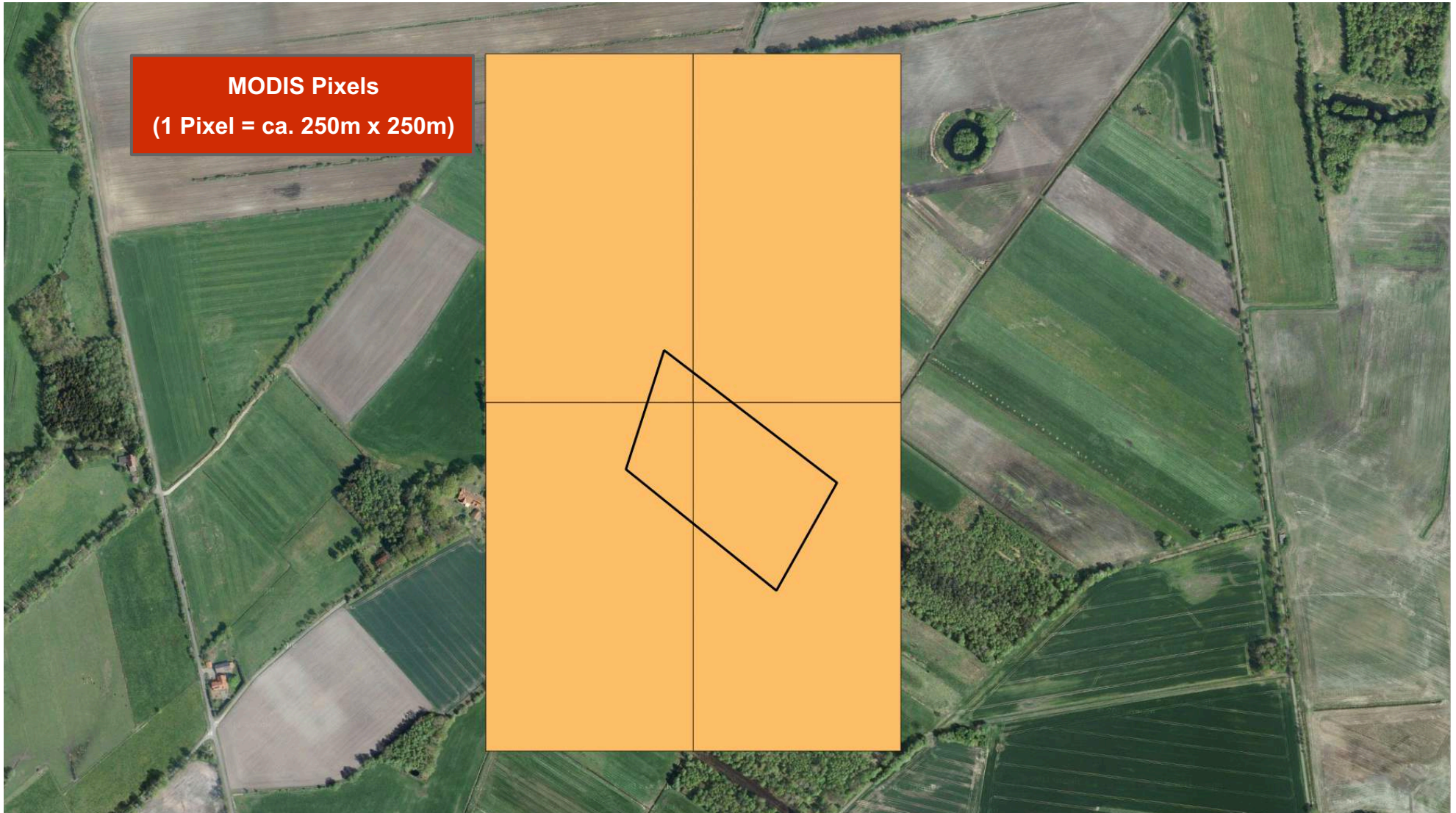


# Land use change Heatmaps and EVI time series together allows for a precise detection of grassland/savanna conversion

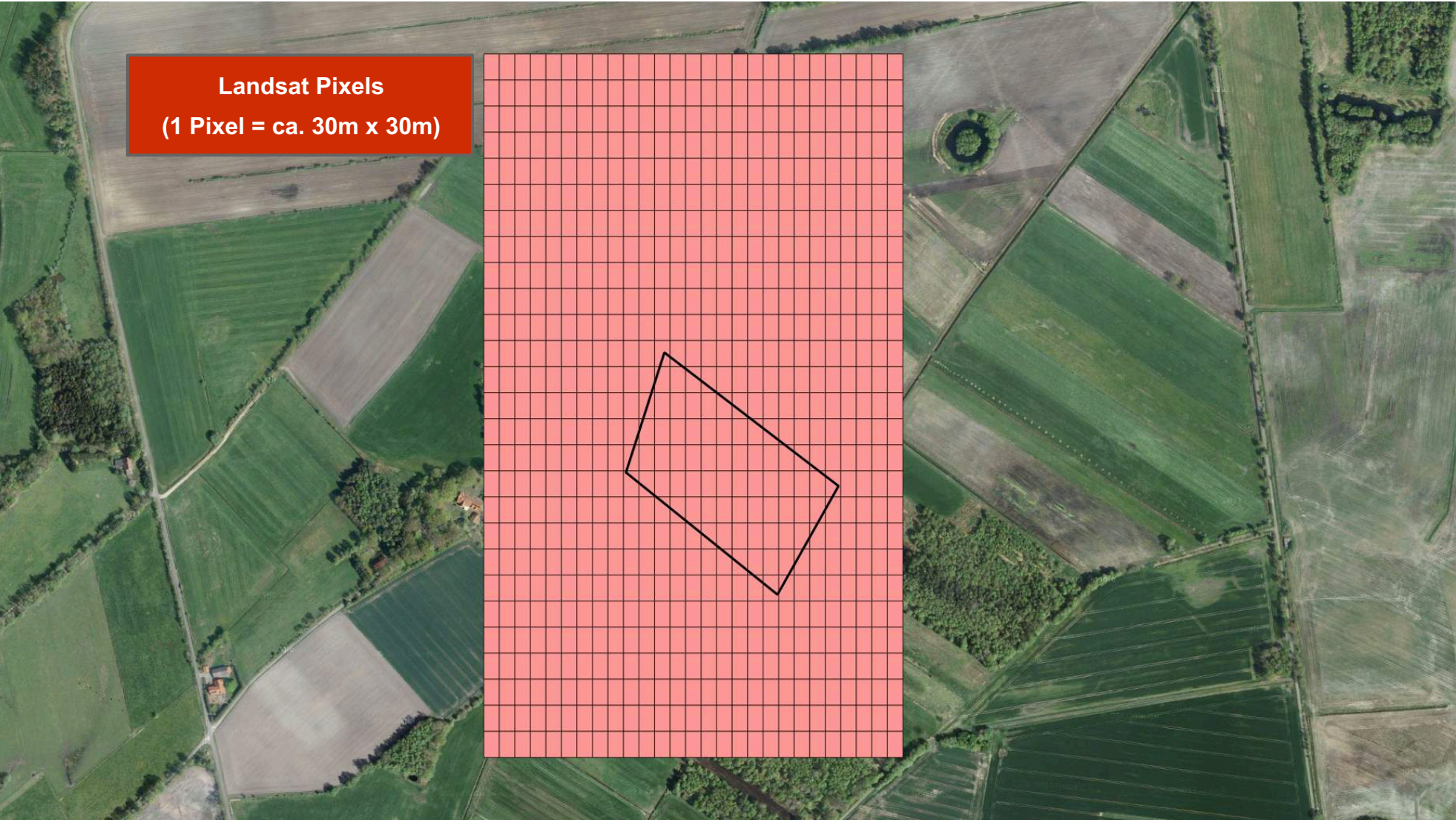




# Is the methodology suitable for Europe?



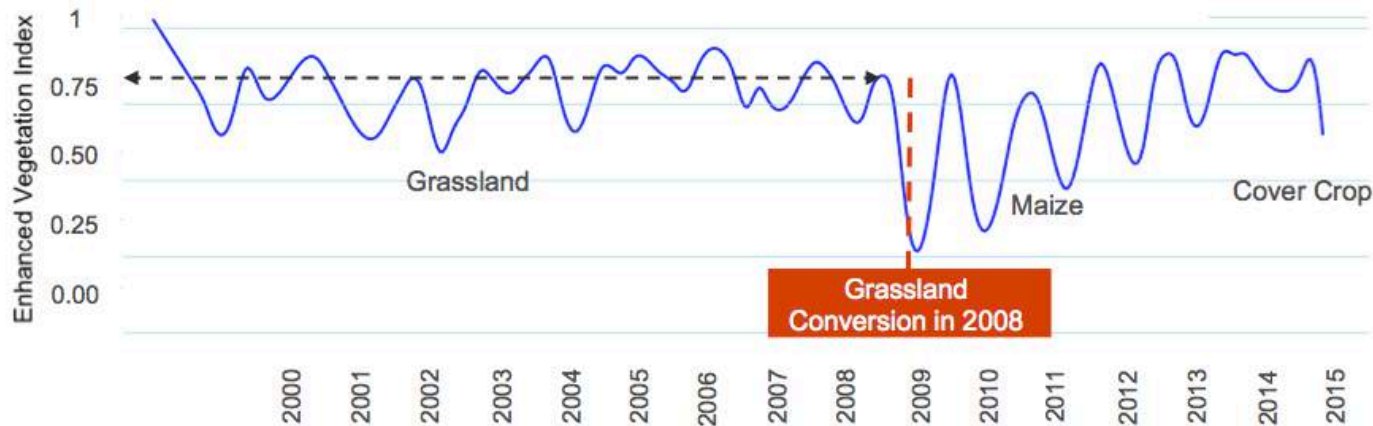
# The higher resolution of Landsat images is more reliable in detecting grassland conversion on small parcels



# A new methodology has been developed by GRAS to easily detect grassland conversion on very small parcels

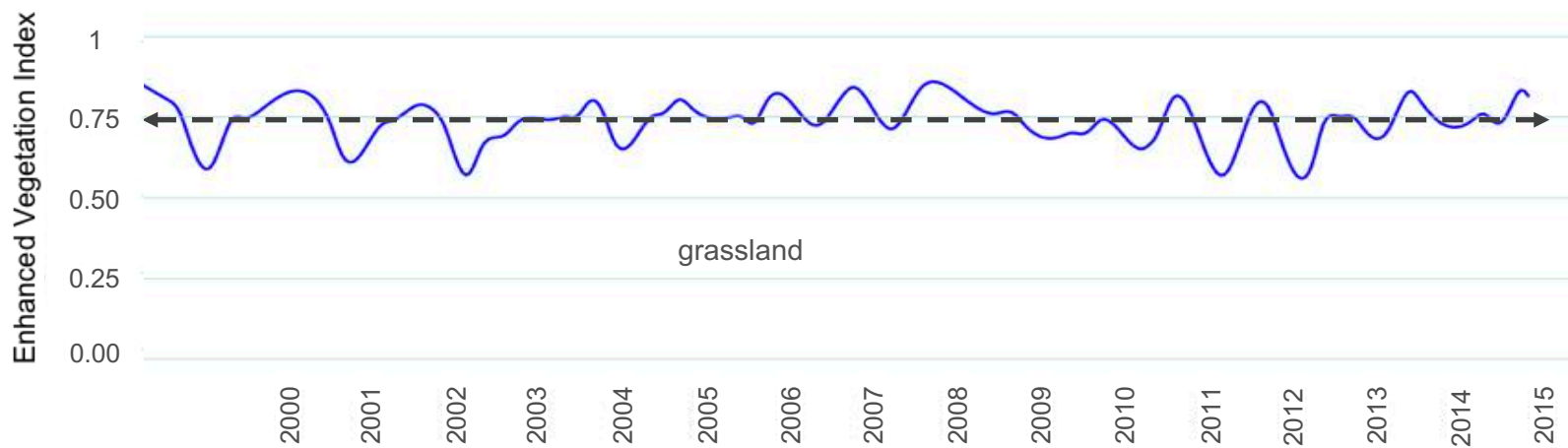


- A new methodology based on high resolution **Landsat image** (30mx30m) **EVI time series** to detect grassland conversion has already been **tested successfully** in Germany
- A huge amount of Landsat images is needed. **Expertise is required** to obtain easily interpretable time series for grassland conversion for areas smaller than 1ha
- Approach being developed in **cooperation with BirdLife Europe**

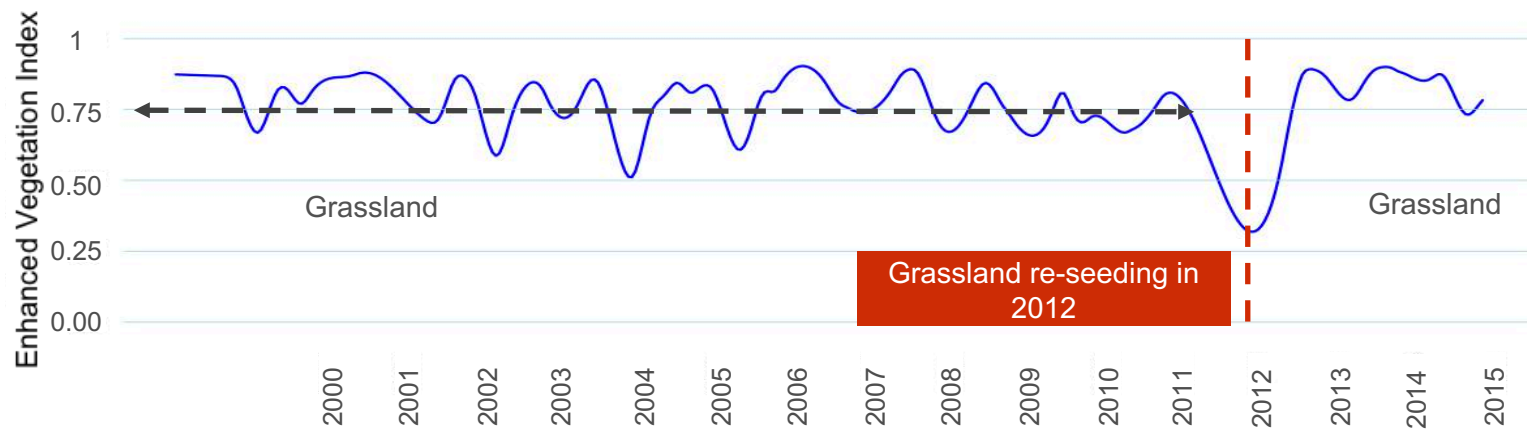


Partnership for  
nature and people

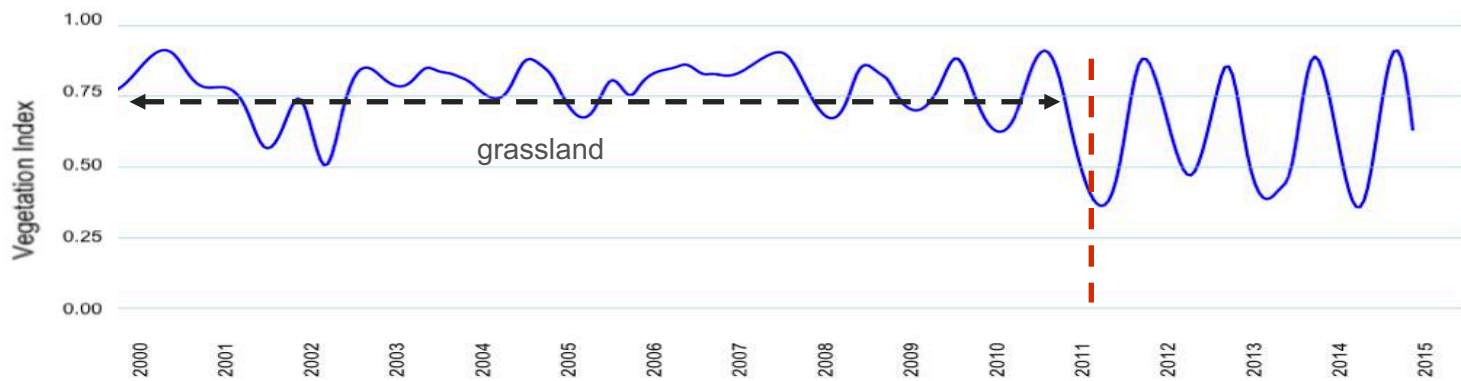
# EVI of a football field: no conversion took place



GRAS also can detect the land use after the conversion. In this case grassland can be detected after re-seeding in 2012

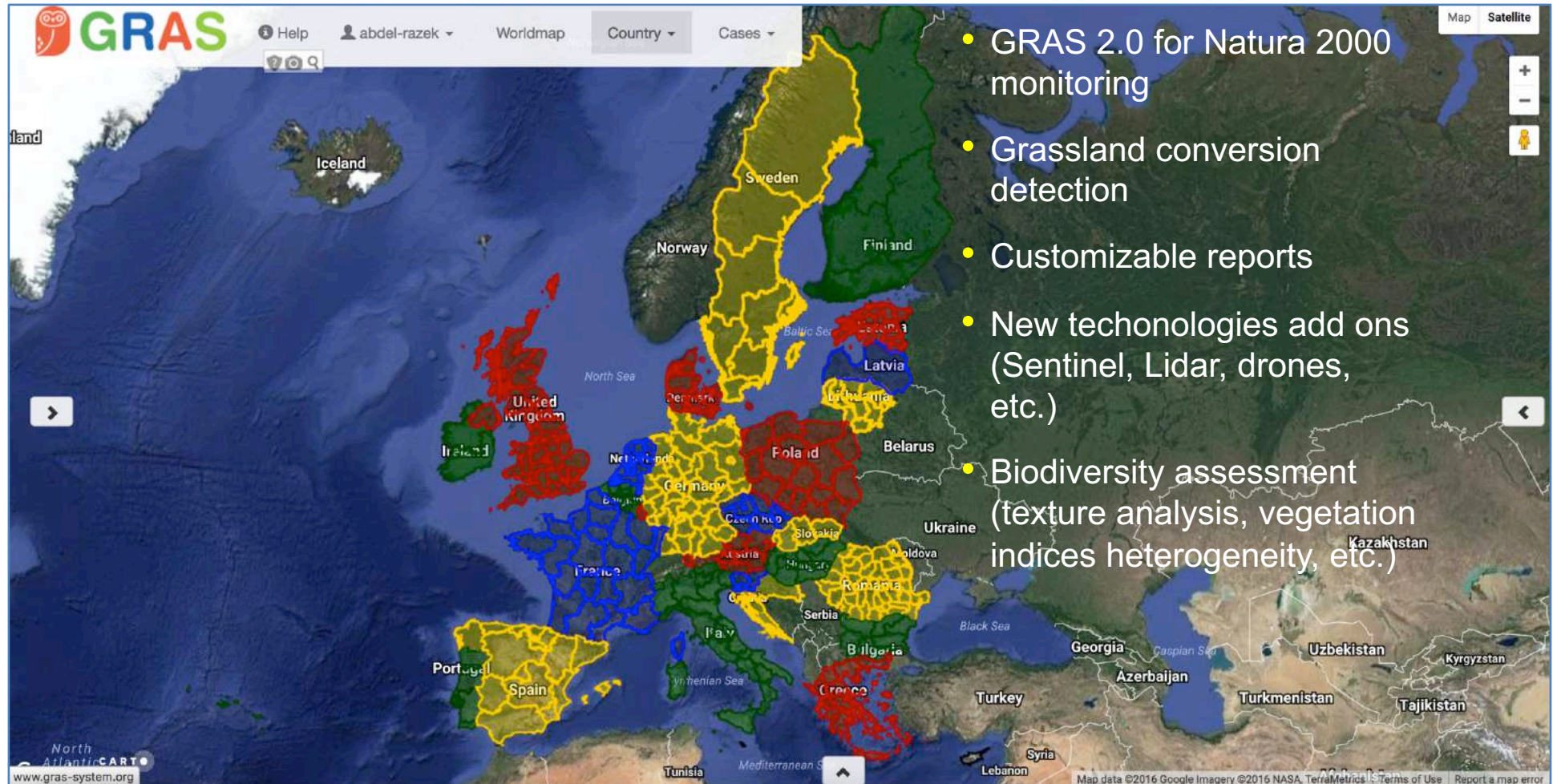


# Grassland conversion in 2011 and annual crops afterwards



Grassland conversion

# GRAS 2.0 for Natura 2000 sites



# Conclusions

- The use of remote sensing data and provision of an easy to use tool can **facilitate consistent and transparent implementation** and enforcement of BHD
- Tools like **GRAS can contribute to an improvement of procedures** and to take actions to **prevent, detect and sanction violations** of existing legislation
- To achieve this, **scaling up of GRAS is required** regarding inclusion of further **content** into GRAS and use of latest **technologies**, e.g.:
  - Change from MODIS to Landsat
  - Integration of new high resolution Sentinel images and other available data
  - Integration of additional data, e.g. Lidar and hyperspectral imagery to detect biodiversity classes
  - Further development of online platform





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