Copernicus Land Monitoring Service

Monitoring stability of protected areas & related pressures: Natura2000 sites

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Submodule D: Monitoring stability of Natura2000 sites

Information on Natura 2000:

- Natura 2000 is Europe's ecological network of protected areas and the key instrument to biodiversity protection in the EU
- Based on the 1979 Birds Directive & 1992 Habitats Directive.
- The protected N2000 sites are planned to have a spatial and functional connectivity to allow species and biodiversity hot spots to interact, exchange and thus stay healthy.
- Further Information and maps can be found here:

  http://land.copernicus.eu/local/natura/view

  http://natura2000.eea.europa.eu/#

NATURA 2000

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Monitoring the stability of Natura 2000 sites

- **Contribute** to assessment of the effectiveness of the Natura 2000 network in terms of halting the decline of certain habitat types
- **Support and facilitate** downstream work on biodiversity monitoring
- **Focus** on a selection of **semi-natural/species rich grassland** habitats
- **Map & monitor** land cover / land use (changes) including a **2 km buffer zone** of selected Natura 2000 sites
- Analyse **pressures** in the buffer zone
- **Assess** grasslands habitat changes

Natura2000 Product Specifications

- Land cover / land use nomenclature based on the MAES ecosystem types (Mapping and Assessment of Ecosystems and their Services)
- Hierarchical structure (4 levels):
  Level 1: 10 classes; Level 4: 62 classes (currently under consolidation)
- Largely compatible with CORINE, Urban Atlas und Riparian Zones nomenclature
- Vector data (polygons)
- Minimum Mapping Unit 0.5 ha (land cover/use status 2012/2006 and Changes)
- Minimum Mapping Width 10m
- Overall Accuracy 2006+2012: 85%, Change Areas: 80%

MAES_Level_1
1 Urban
2 Croplands
3 Woodland and forest
4 Grassland
5 Heathland and scrub
6 Sparsely vegetated land
7 Wetland
8 Lagoons, coastal wetlands and estuaries
9 Rivers and lakes
10 Marine (other)
Overall

Input Data used for the assessment

- **Satellite Imagery:**
  ESA Data Warehouse: VHR CORE_03 SPOT-5/6 (2.5m) and Pléiades scenes

- **Auxiliary data:**
  - Riparian Zones & Urban Atlas 2012 LC/LU
  - other: CORINE Land Cover, HR Layers, OSM, …

- **Methodology:**
  Visual image interpretation and delineation of land cover/use from VHR satellite imagery

- **Output:** Vector data set of land cover/use 2006+2012 & changes

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Focus on Grassland;
e.g. habitats of a N2K site in Southern Germany

SPOT-5, 2.5 m, Date: 2011-08-25

6210: Semi-natural dry grasslands on calcareous substrates

6510: Lowland hay meadows

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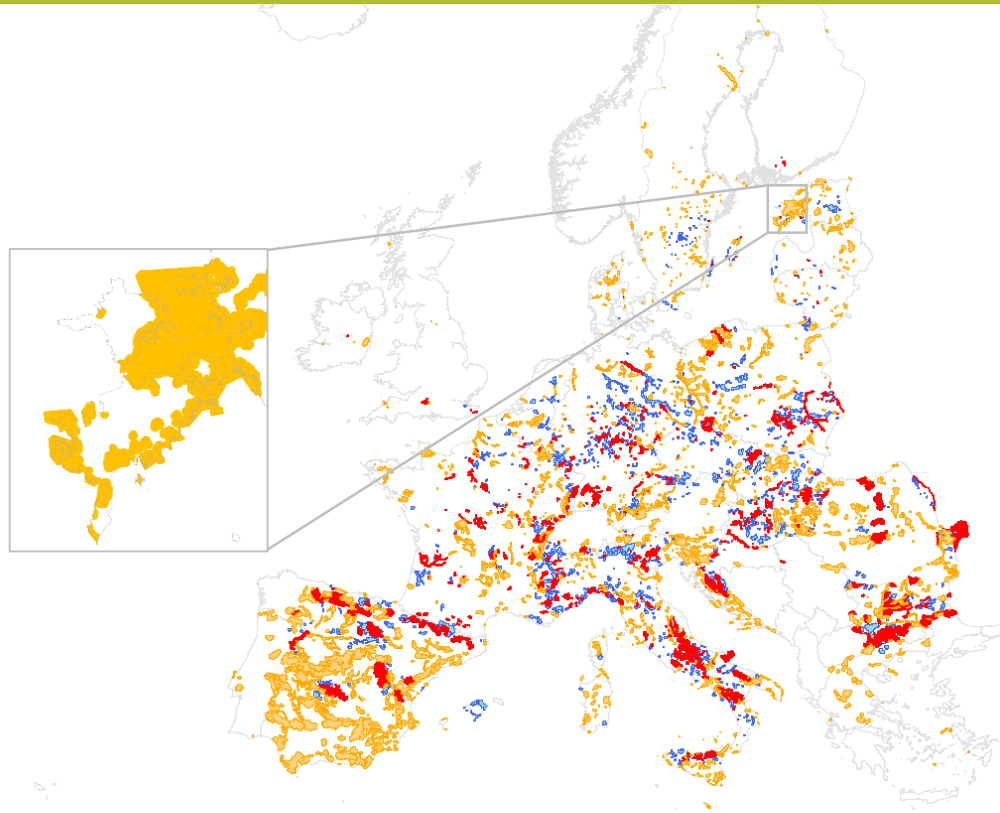

Current coverage & upcoming Natura2000 product extension (2006/12)

Existing N2000 product

Natura2000 product extension:

Phase 1 (ongoing, in 2017)

Phase 2 (planned, in 2018)

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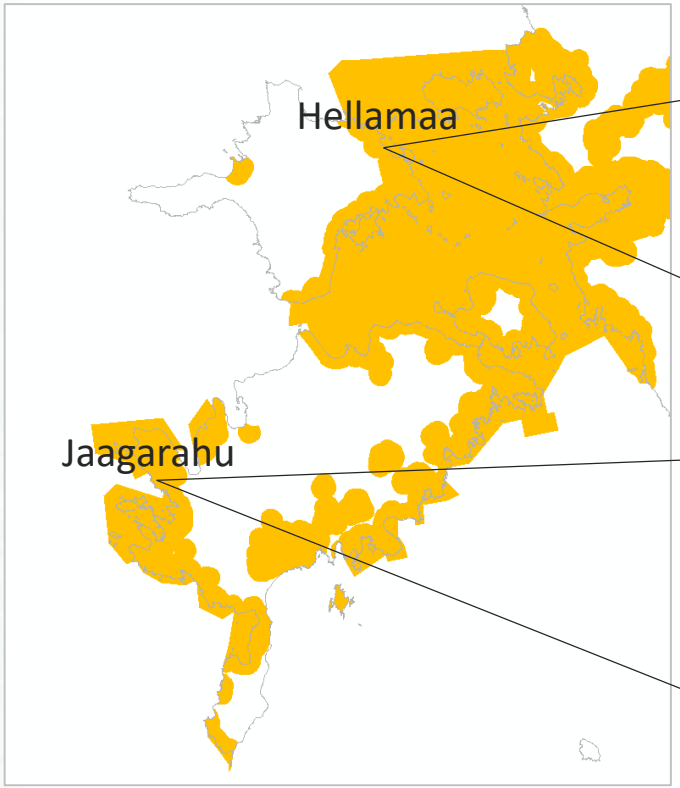
N2000 sites with semi-natural LC/LU (Estonia) - upcoming



Source: Google Earth

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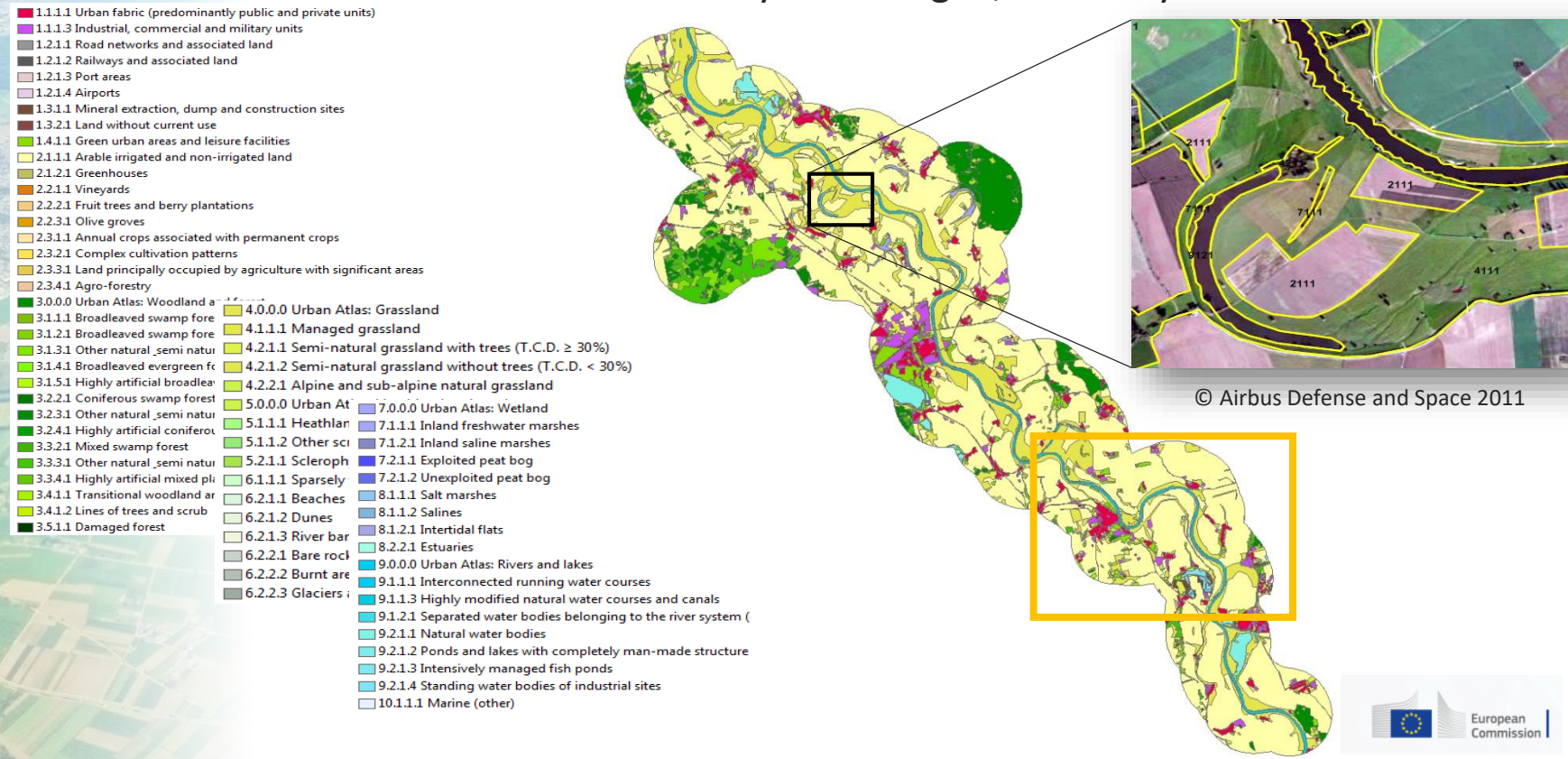
Elbe river valley near Torgau, Germany



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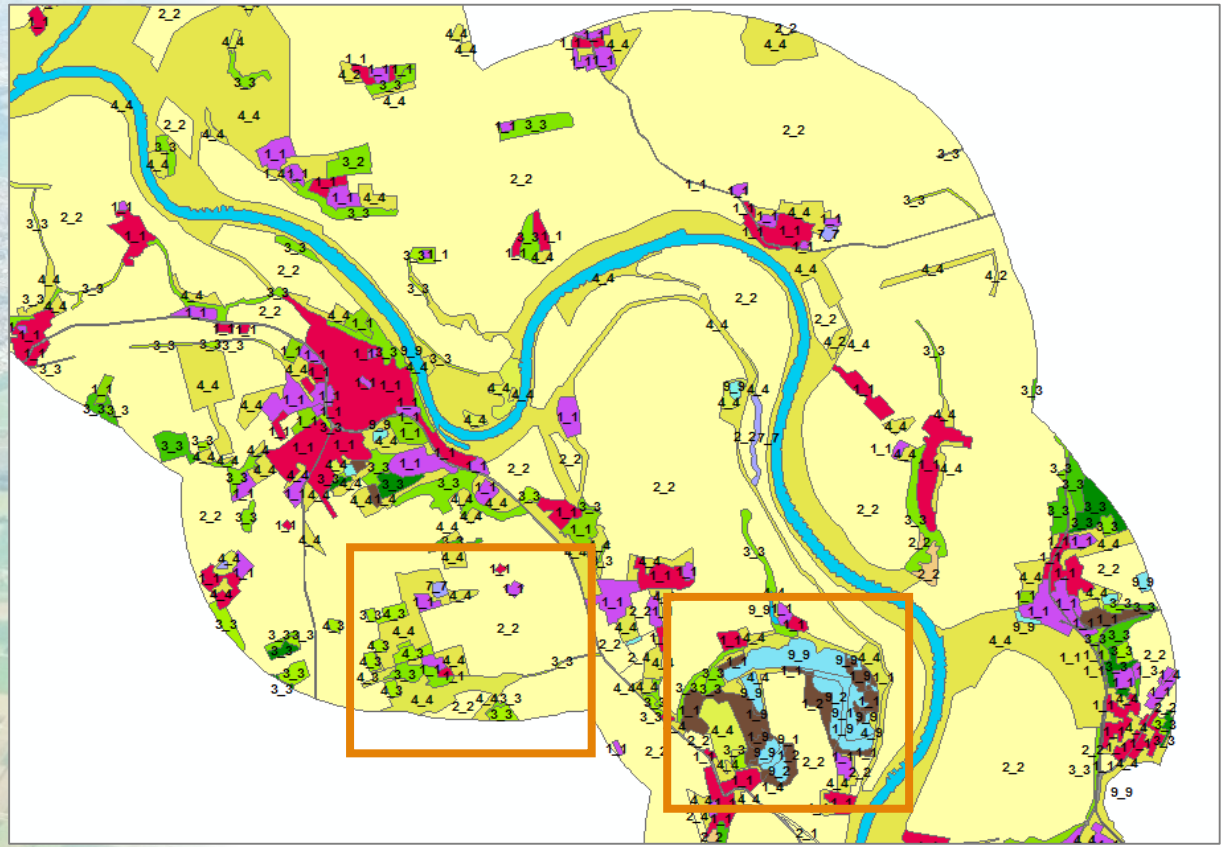

Germany, Elbe, north of Riesa

Zoom-in:
Land cover/land use 2012

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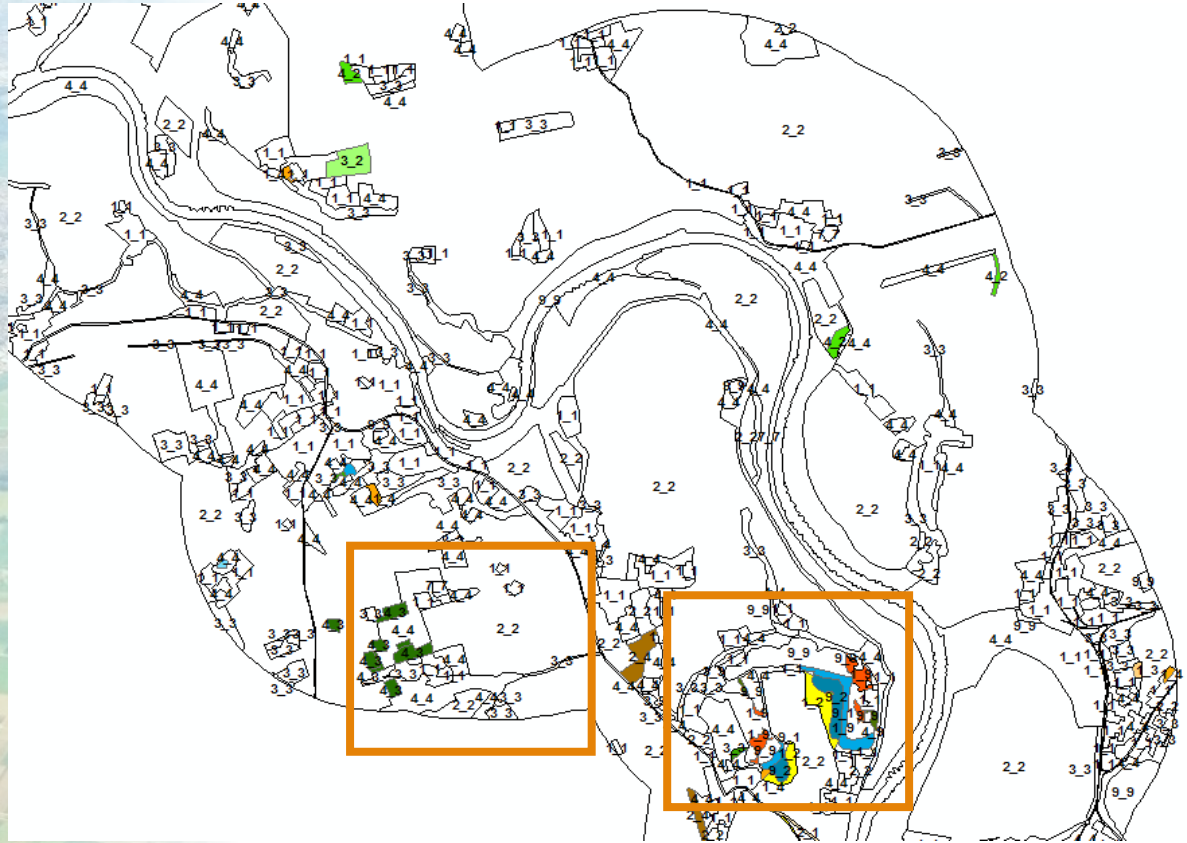

Germany, Elbe river valley

Zoom-in:
Land cover/land use
Change 2006-2012

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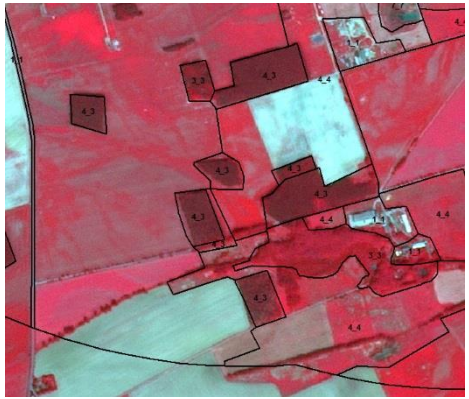
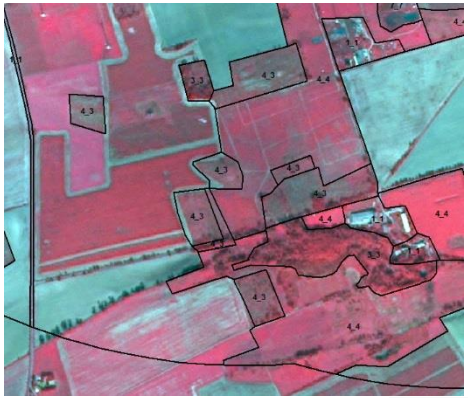


2006



2012

Change from forest (2006) to grassland (2012)

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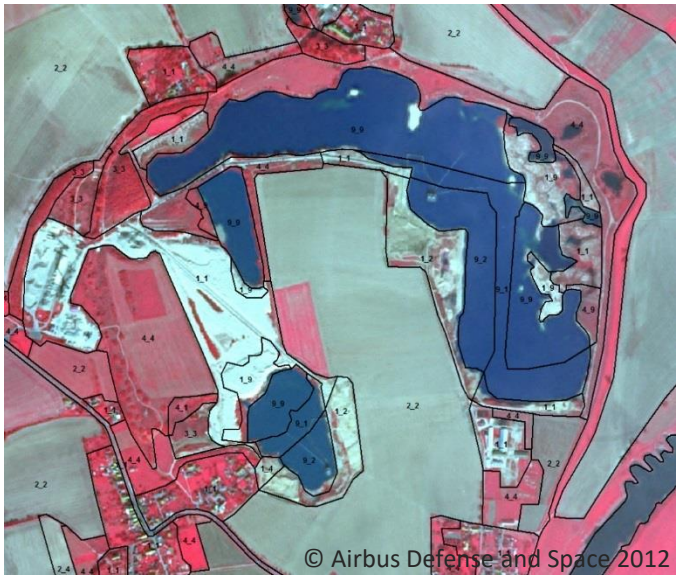
2006



2012

Active Gravel-pit showing several changes over time

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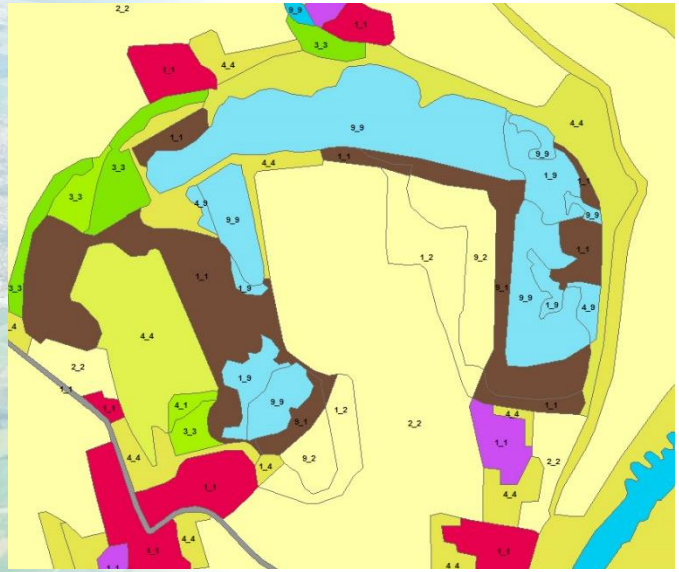
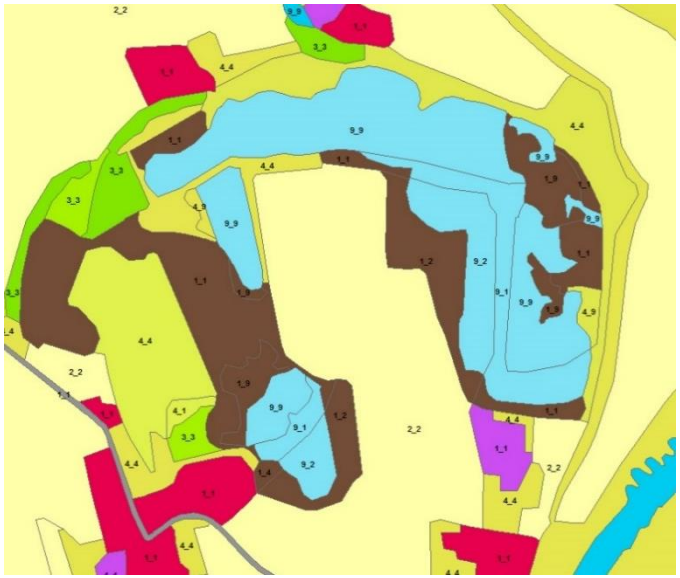


2006



2012

The growing gravel extraction area consumes arable land

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Urbanisation: Change from grassland/cropland to urban

SPOT-5 2006

SPOT-5 2012

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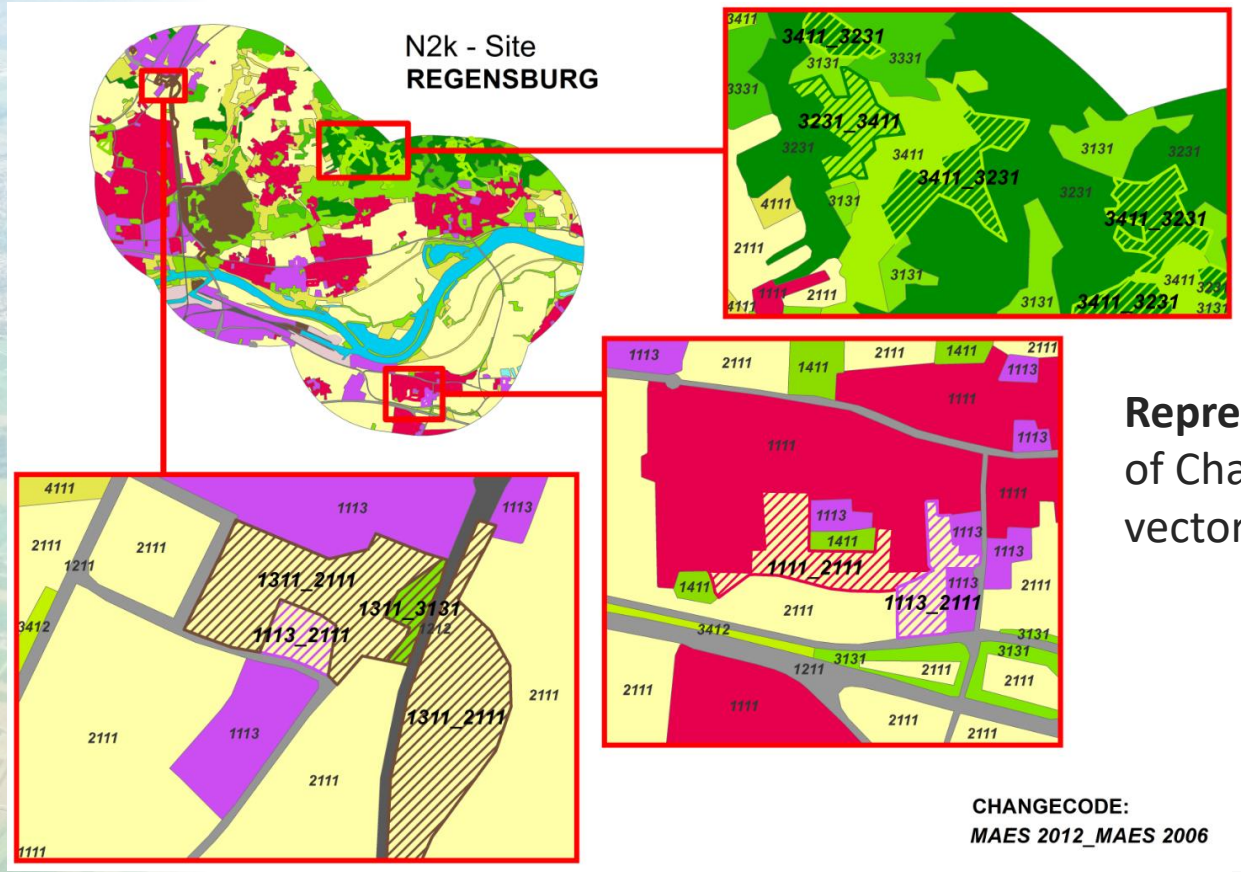

Representation
of Change areas in vector file format

CHANGECODE:
MAES 2012_MAES 2006

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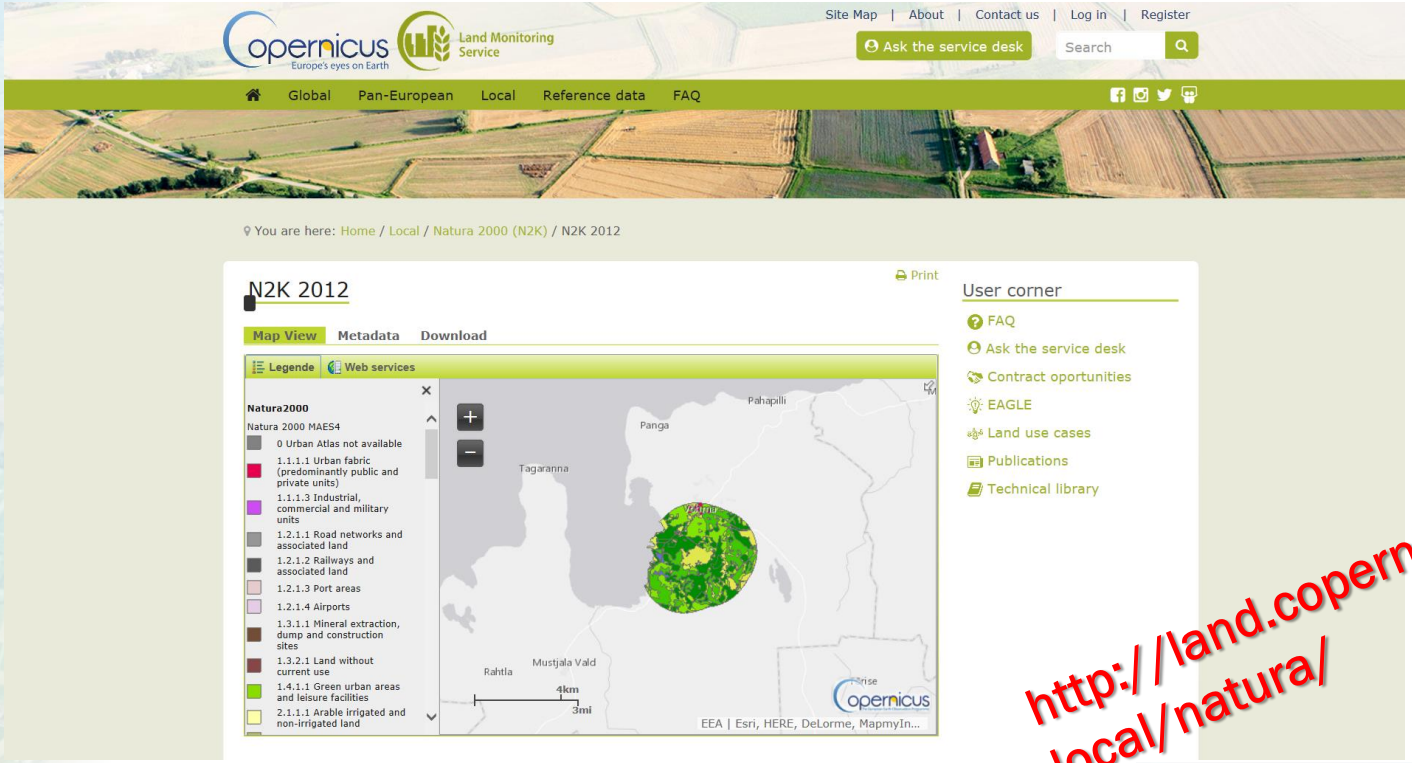


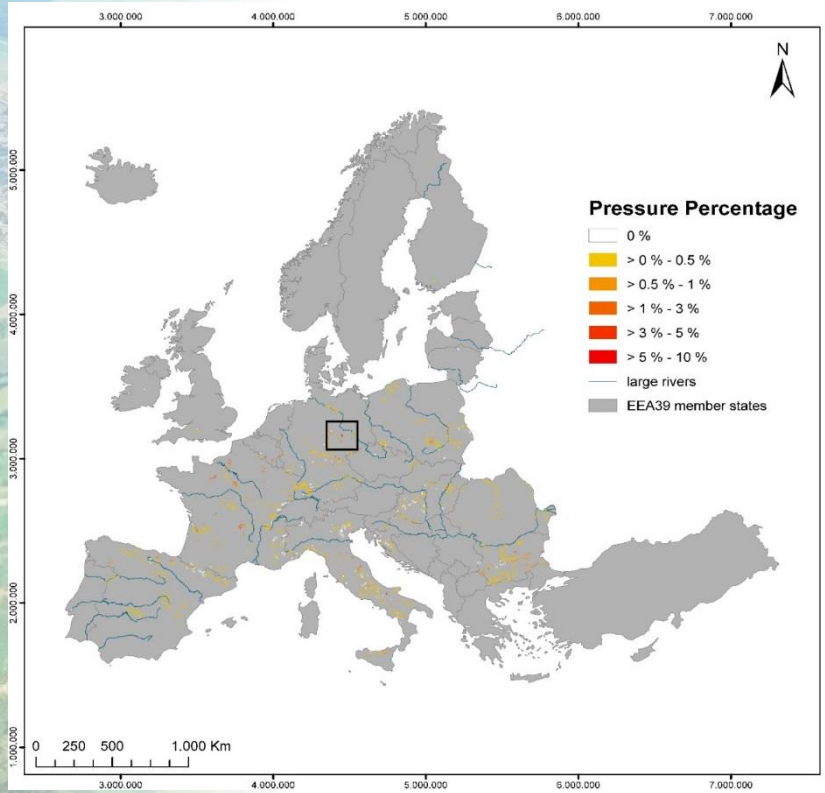
http://land.copernicus.eu/local/natura/

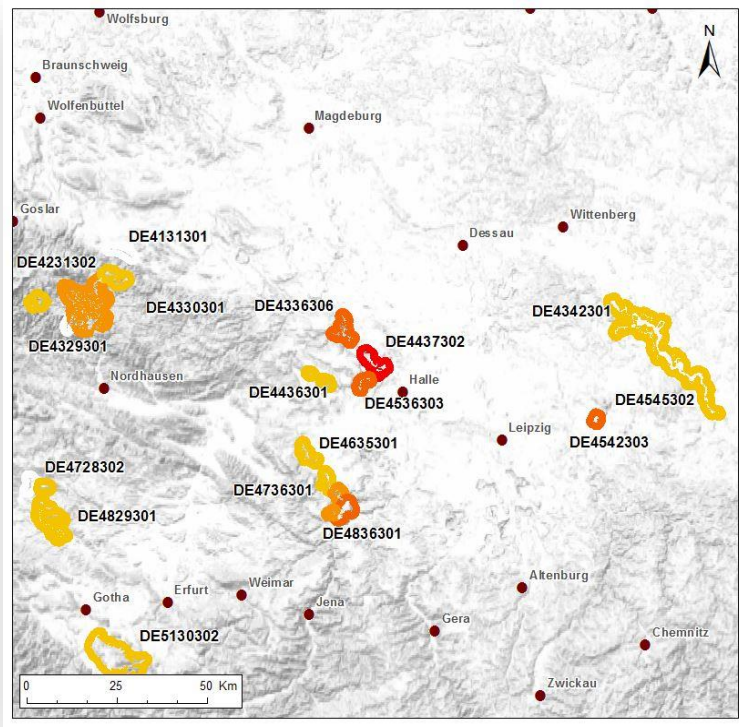
Pressure Analysis

- Performed in **2km buffer** zone surrounding the selected N2000 sites
- Identification of general **processes** and landscape-level trends being active and **impacting on the N2000 site**
- Use of an adapted **land cover change - pressure association matrix**
- Considered **relevant Presures:**
  - Urbanization
  - Agricultural intensification
  - Afforestation
  - Deforestation
  - Land Abandonment
  - Drainage
- **Reverse processes** (e.g. arable/grassland conversion) also need to be considered, in order to properly account for the overall balance.

Pressure: e.g. Agricultural Intensification

Pressure maps: showing percentages of individual pressures, per site





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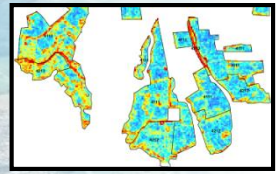
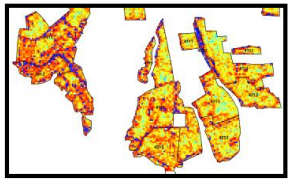
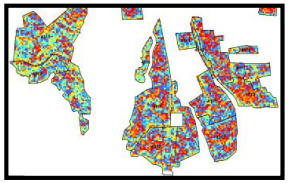
Results of first Copernicus Natura 2000 assessment 2006-2012

Most prominent causes of pressures on grassland:

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Preliminary results of first Copernicus N2000 assessment 2006-12

- Main Pressure: Agricultural Intensification
- Other found Pressures (in decreasing order of magnitude): Urbanisation; Land Abandonment; Shrub Encroachment/Afforestation
- Generally small grassland decline; significant protective effect of N2000 sites as compared to surrounding area

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