Copernicus Land Monitoring Service

Monitoring stability of protected areas & related pressures: Natura2000 sites

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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: 55 classes (previously 62)
- 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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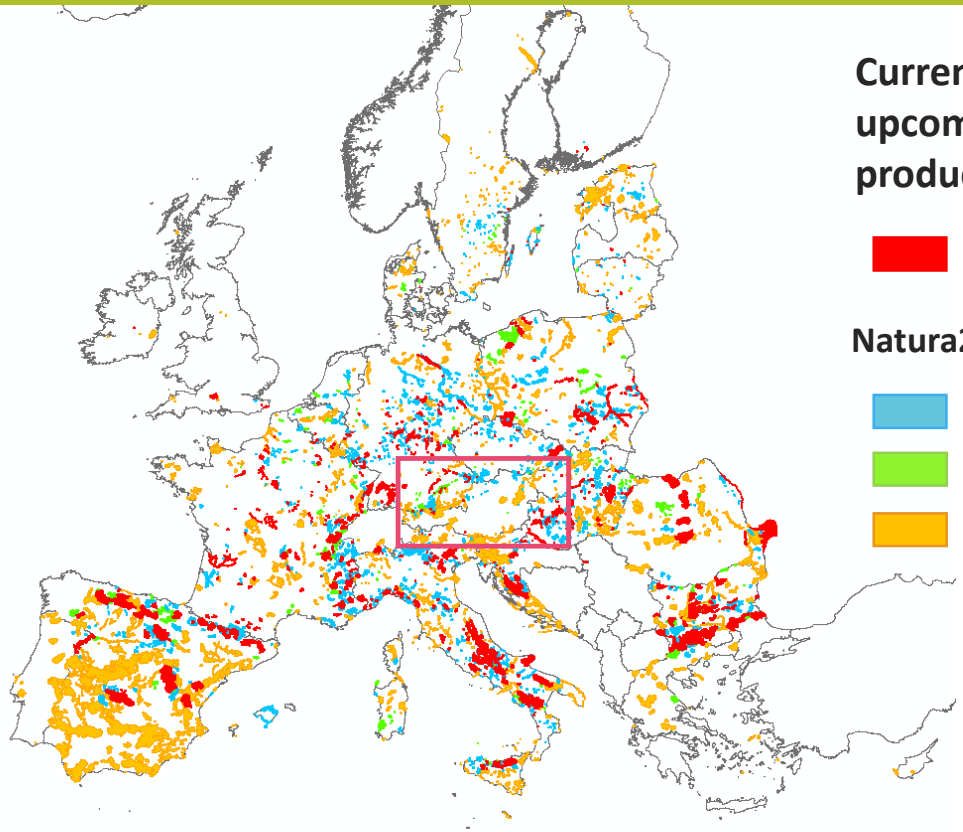

Current coverage & upcoming Natura2000 product extension (2006/12)

N2000 GIO phase

Natura2000 product extension:

Phase 1 (finished, 2017)

Phase 2 (finished, 2018)

Phase 3 (ongoing, 2018-2019)

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N2000 sites with semi-natural LC/LU (Austria)

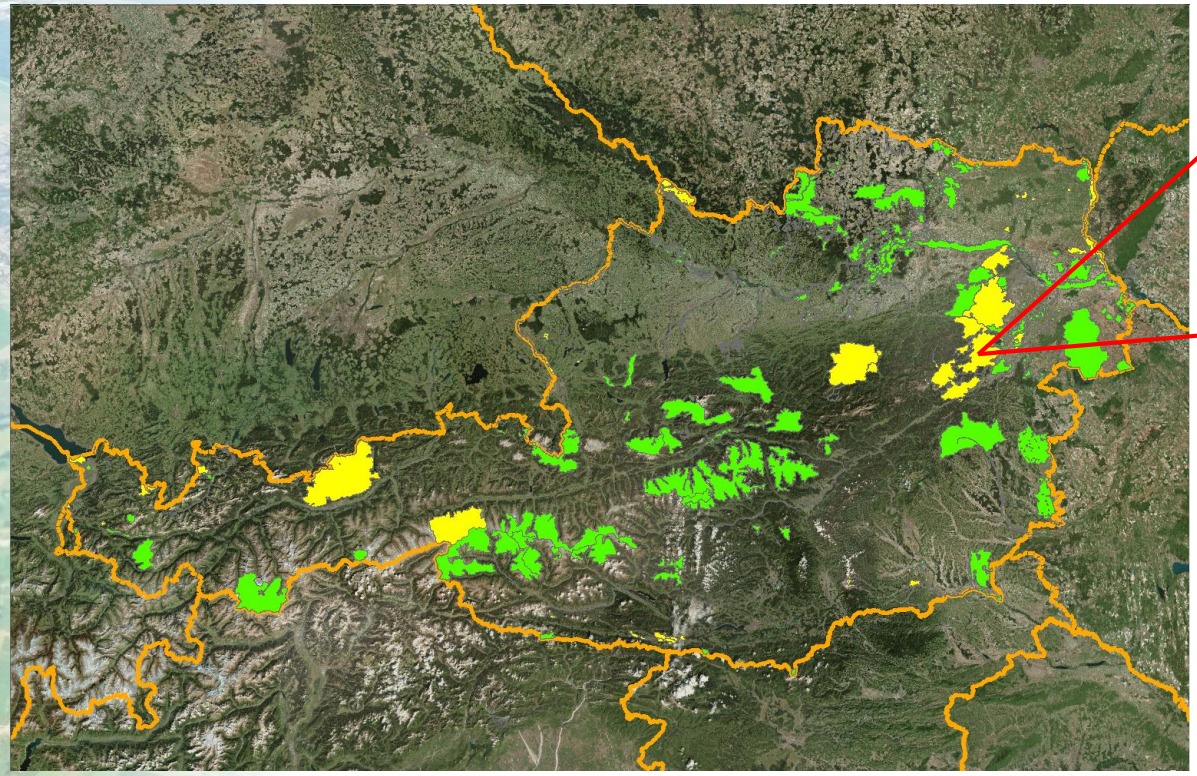

Image from http://www.hoeflein.com/index.php/tourismus

All Austrian Natura 2000 Sites

Selected Natura 2000 sites currently addressed by Copernicus

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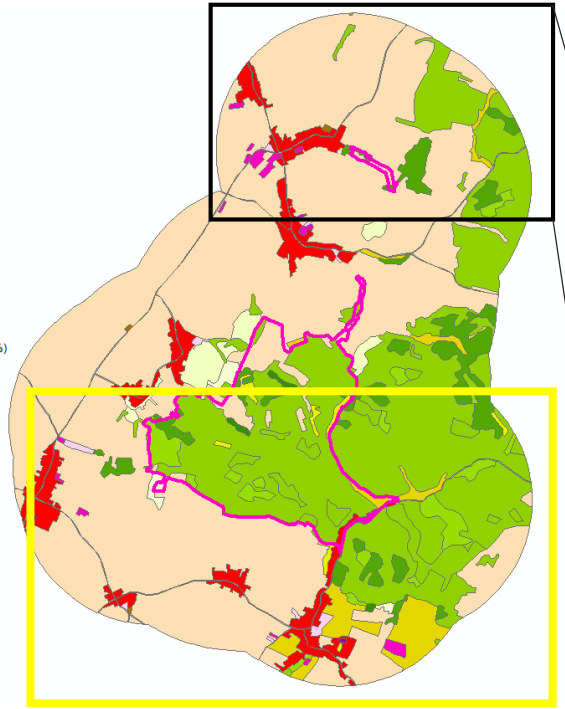
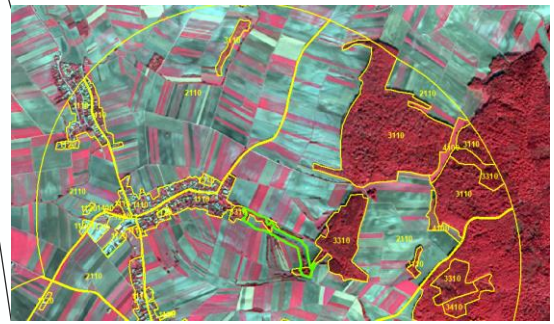
Austria, Weinviertler Klippenzone

- 1.1.1.0 Urban fabric (predominantly public and private units)
- 1.1.2.0 Industrial, commercial and military units
- 1.2.1.0 Road networks and associated land
- 1.2.2.0 Railways and associated land
- 1.2.3.0 Port areas and associated land
- 1.2.4.0 Airports and associated land
- 1.3.1.0 Mineral extraction, dump and construction sites
- 1.3.2.0 Land without current use
- 1.4.0.0 Green urban, sports and leisure facilities
- 2.1.1.0 Arable irrigated and non-irrigated land
- 2.1.2.0 Greenhouses
- 2.2.1.0 Vineyards, fruit trees and berry plantations
- 2.2.2.0 Olive groves
- 2.3.1.0 Annual crops associated with permanent crops
- 2.3.2.0 Complex cultivation patterns
- 2.3.3.0 Land principally occupied by agriculture with significant areas of natural vegetation
- 2.3.4.0 Agro-forestry
- 3.1.1.0 Natural & semi-natural broadleaved forest
- 3.1.2.0 Highly artificial broadleaved plantations
- 3.2.1.0 Natural & semi natural coniferous forest
- 3.2.2.0 Highly artificial coniferous plantations
- 3.3.1.0 Natural & semi natural mixed forest
- 3.3.2.0 Highly artificial mixed plantations
- 3.4.1.0 Transitional woodland and scrub
- 3.4.2.0 Lines of trees and scrub
- 3.5.0.0 Damaged forest
- 4.1.0.0 Managed grassland
- 4.2.1.1 Semi-natural grassland with trees (TCD ≥ 30 %)
- 4.2.1.2 Semi-natural grassland without trees (TCD < 30%)
- 4.2.2.0 Alpine and sub-alpine natural grassland
- 5.1.1.0 Heathland and Moorland
- 5.1.2.0 Other scrub land
- 5.2.0.0 Sclerophyllous vegetation
- 6.1.0.0 Sparsely vegetated areas
- 6.2.1.0 Beaches and dunes
- 6.2.2.0 River banks
- 6.3.1.0 Bare rocks and rock debris
- 6.3.2.0 Burnt areas (except burnt forest)
- 6.3.3.0 Glaciers and perpetual snow
- 7.1.0.0 Inland marshes
- 7.2.1.0 Exploited peat bog
- 7.2.2.0 Unexploited peat bog
- 8.1.1.0 Coastal salt marshes
- 8.1.2.0 Salines
- 8.1.3.0 Intertidal flats
- 8.2.1.0 Coastal lagoons
- 8.2.2.0 Estuaries
- 9.1.1.0 Interconnected water courses
- 9.1.2.0 Highly modified water courses and canals
- 9.1.3.0 Separated water bodies belonging to the river system
- 9.2.1.0 Natural water bodies
- 9.2.2.0 Artificial standing water bodies
- 10.0.0.0 Sea and ocean





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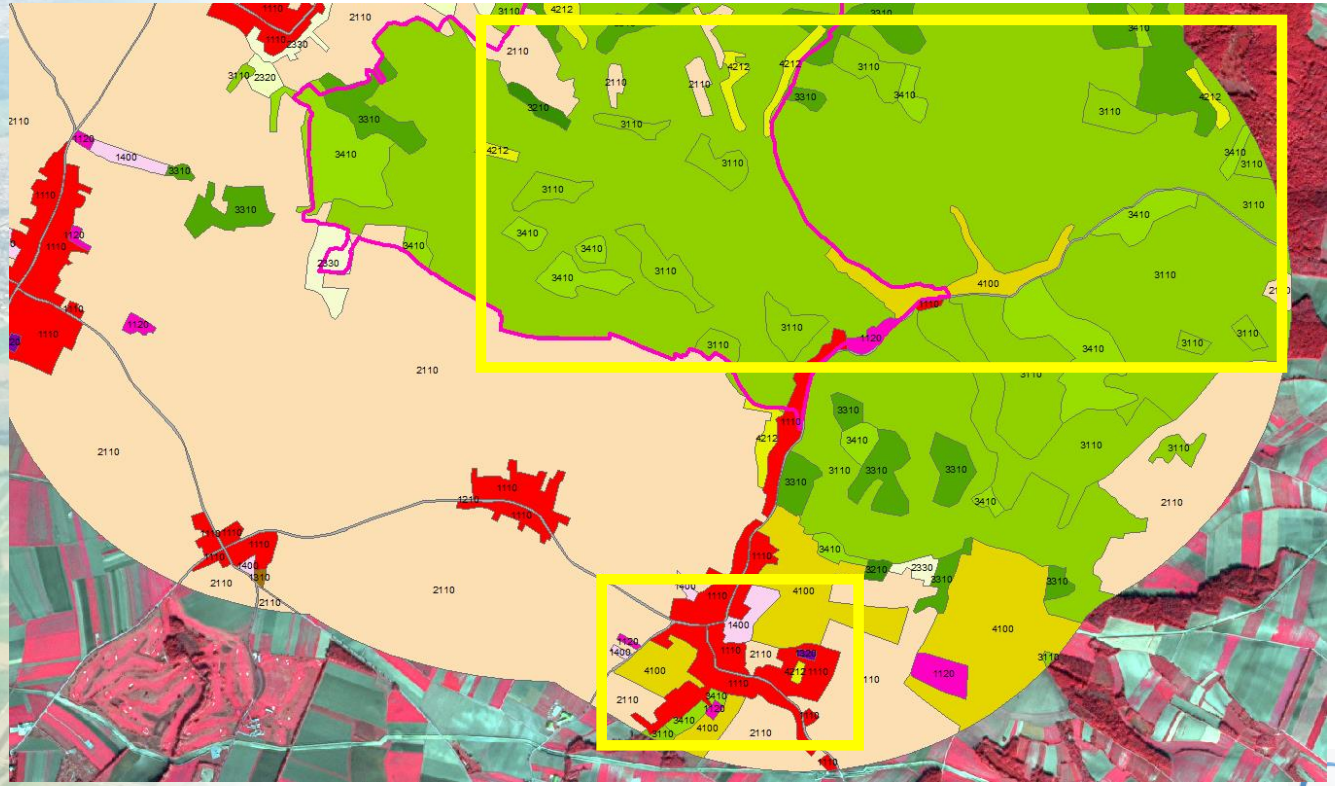

Austria, Weinviertler Klippenzone

Zoom-in:
LC/LU changes
2006 to 2012

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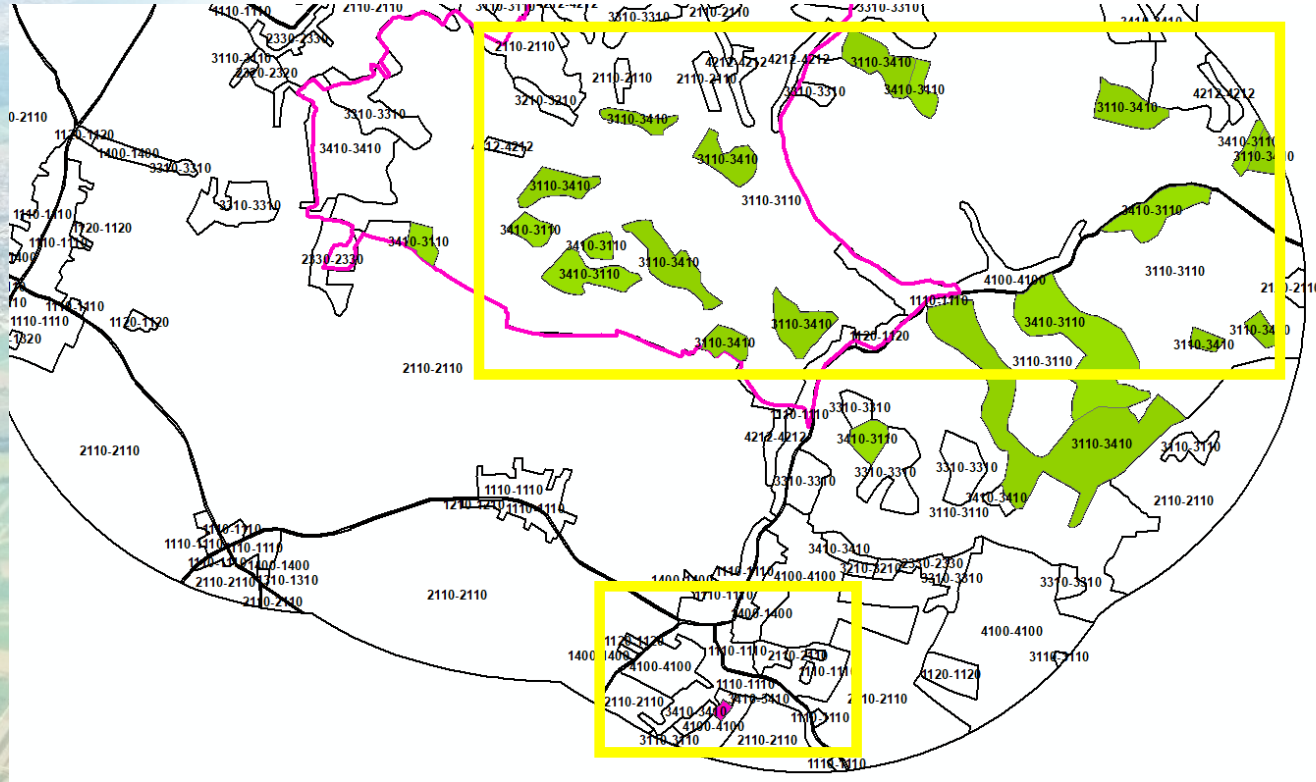

Austria, Weinviertler Klippenzone

Zoom-in:
Green : Changes in forest activity (deforestation – reforestation)

Pink: Urbanisation activity (from grassland to urban)

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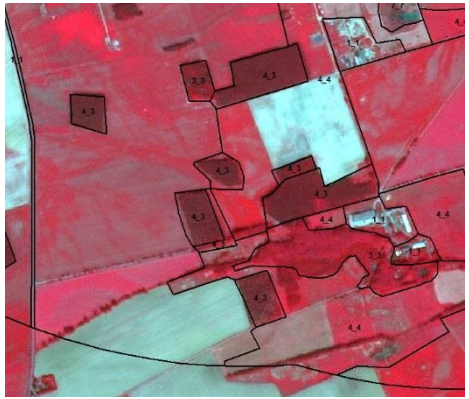
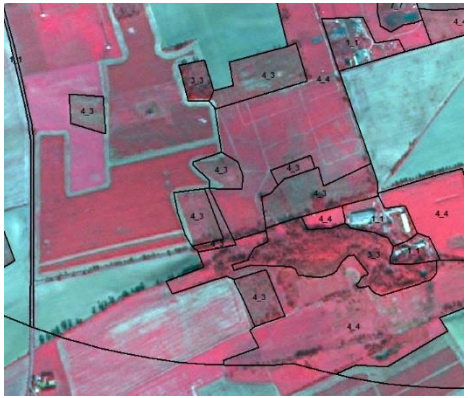


2006



2012

Change from forest (2006) to grassland (2012)

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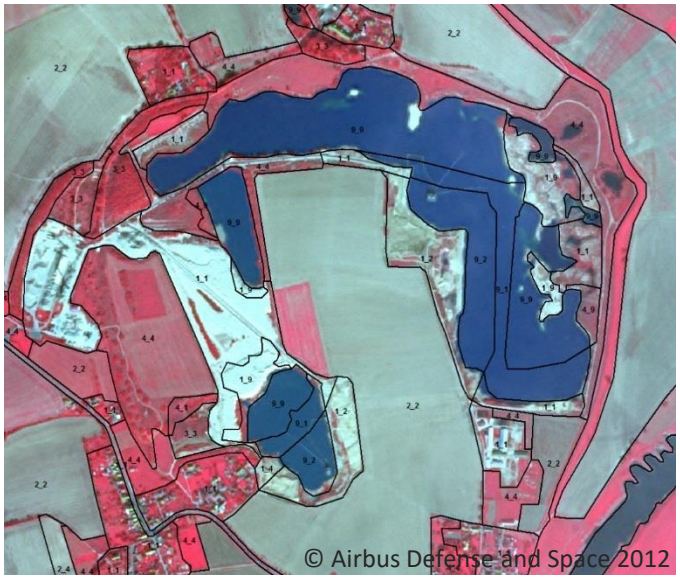
2006



2012

Active Gravel-pit showing several changes over time

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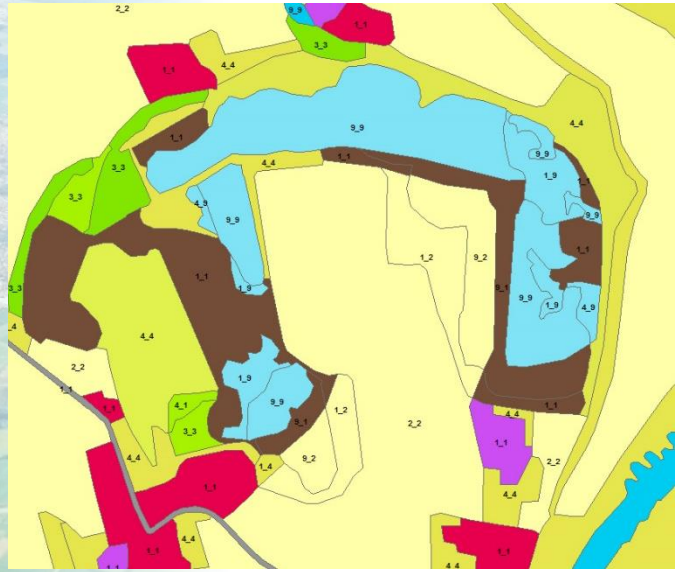
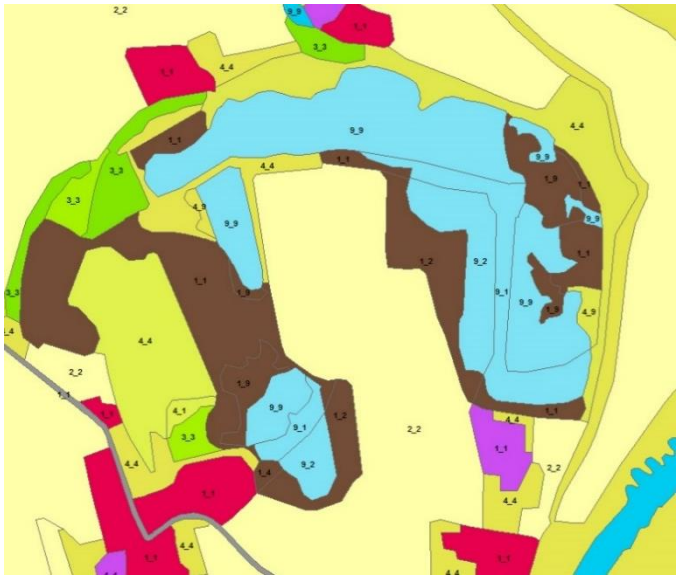


2006



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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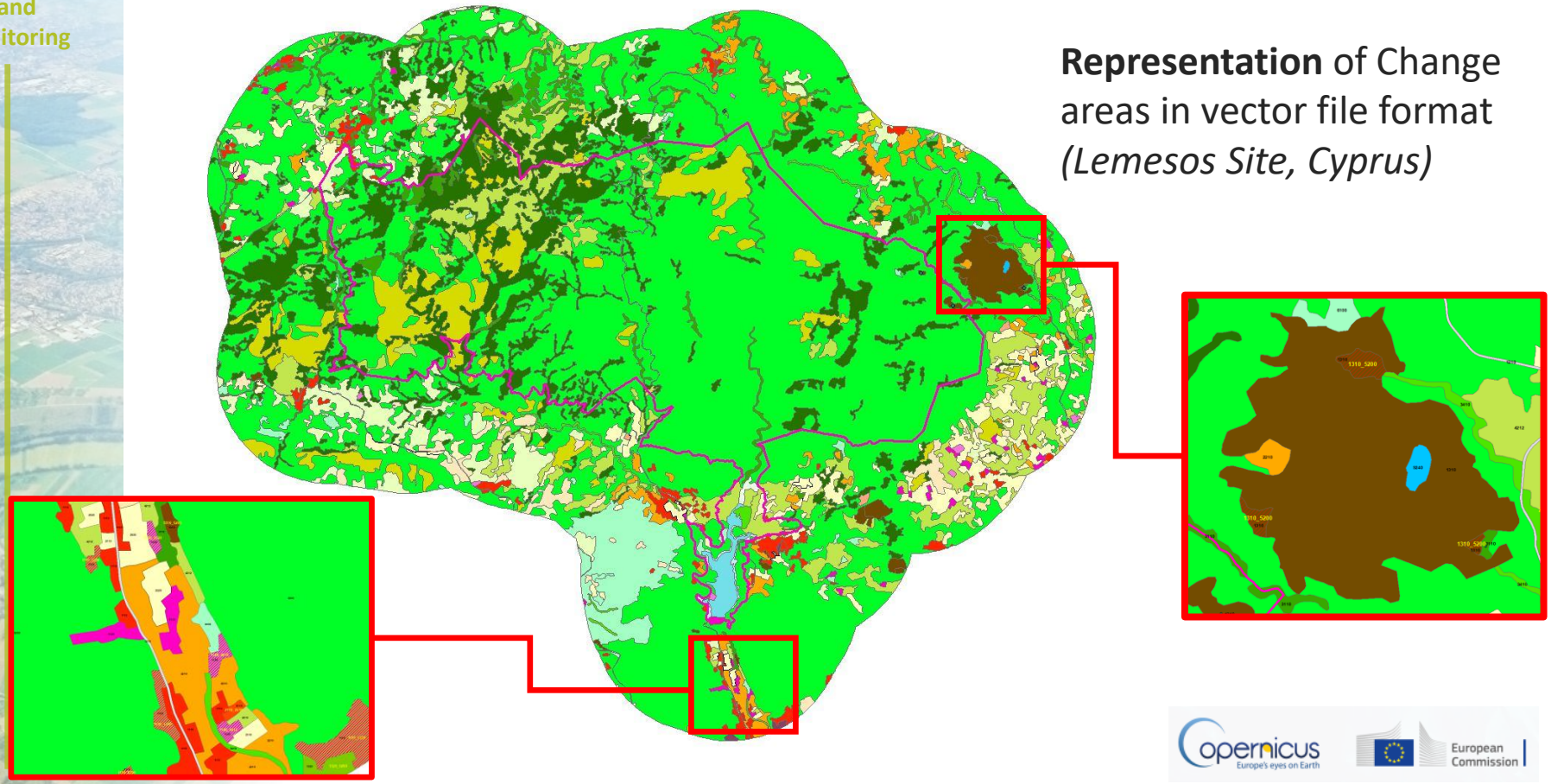

Representation of Change areas in vector file format *(Lemesos Site, Cyprus)*

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

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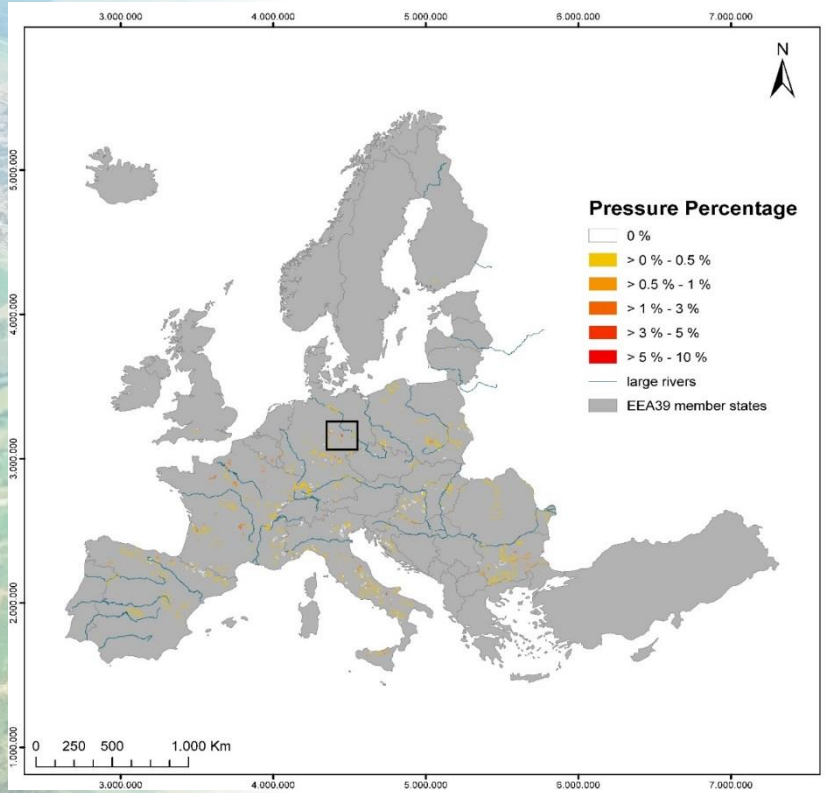
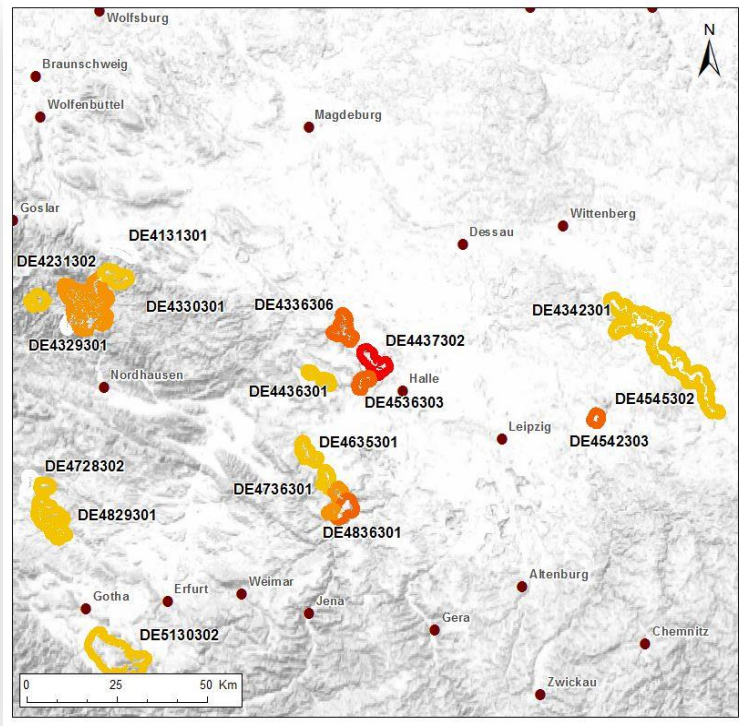
Pressure Analysis

- 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.

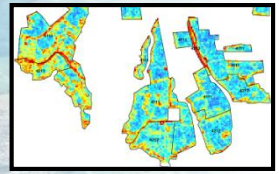
Pressure: e.g. Agricultural Intensification

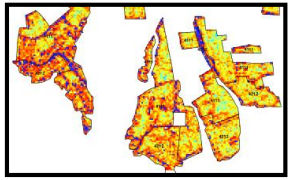
Pressure maps: showing percentages of individual pressures, per site

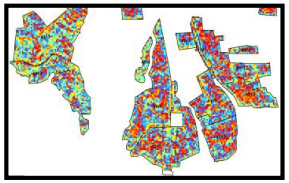




Results of first Copernicus Natura 2000 assessment 2006-2012







Most prominent causes of pressures on grassland:

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Preliminary results of first Copernicus N2000 assessment 2006-12 (#1)

- Main Pressure across Europe: 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 (factor of 4!)

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Preliminary results of first Copernicus N2000 assessment 2006-12 (#2)

- Inside Natura2000 sites:
  - At EU Level, main observed driver was land abandonment
  - In NW Europe, agricultural land use intensification is the main driver
  - Several sites did not show any signs of deterioration
- Copernicus clearly helps finding answers in a systematic way. More detailed analyses will follow.

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Thanks for your Interest!

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