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The EcoChange Project

Aim and Focus

The aim of EcoChange is to assess and forecast changes in terrestrial biodiversity and ecosystems. The project assesses the capacity of biodiversity and ecosystems to supply humans with required goods and services and to buffer against climate and land use change.

The project concentrates on the improvement of models and the generation of new data. It also integrates the findings with socio-economic analysis.

Project work is organised into six activities.

Project information

EcoChange – “Challenges in assessing and forecasting biodiversity and ecosystem changes in Europe” is an Integrated Project with 22 Partners from all across Europe. It is supported by the 6th Framework Programme of the European Union.

Contract number: FP6-036866

Project duration: January 2007 - December 2011

The consortium of EcoChange is led by the National Centre for Scientific Research (CNRS), Grenoble, France. Project Co-ordinator: Pierre Taberlet, pierre.taberlet@ujf-grenoble.fr



Briefing Sheet Series 2
2009

Land Cover and Land Use Data

Results of EcoChange Activity 1

Land use and land cover data are important for our understanding of how environmental systems function, and their assessment of change over time is crucial for making informed statements and projections of global change impacts on biodiversity and ecosystems.

This Briefing Sheet presents two aspects of the work within Activity 1 of EcoChange in regard to land cover and land use data: (1) The updating and reconstruction of land cover data; and (2) the downscaling and extension of land use change scenarios.

EcoChange Briefing Sheet

Activity 1

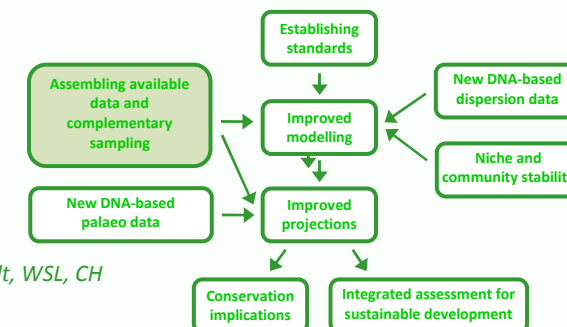
Assembling available data and complementary sampling

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Overview

Land cover and land use¹ are changing rapidly in many parts of Europe. Land use change is considered to be the primary driver for changing biodiversity and ecosystem services over the short to mid-term. Thus, knowledge on these changes is important for spatial planning, resource evaluation or ecological modeling. Therefore, spatially well-resolved land cover data and land use change projections are crucial products for forecasting effects of global change on species and ecosystems.

Land cover

Currently, two consistent data sets from 1990 and 2000 are available regarding land cover across Europe termed CORINE (Coordination of information on the environment). They are provided at a high spatial resolution of 100m. While the data set of 2000 covers EU27, it does not include Norway and Switzerland at this time step. The data set of 1990 neither includes additional countries such as Sweden, Iceland and several countries within Europe formerly belonging to Yugoslavia and the USSR. Within EcoChange, these countries have been updated using a combination of National air- and space-borne data for 1990 and 2000 (e.g. GLC-2000, PELCOM, or National Land cover data sets) in order to generate a complete European coverage.

As hardly any state of land cover consistent with current land cover classifications was available for time steps earlier than ca. 1975, the state of 1960 was reconstructed for a less detailed legend containing seven cover types using digitized data from the World Agricultural Atlas (Fig.1). An application using Ecochange land cover data for Natura 2000 habitat modeling has been published by an Ecochange team (Mucher et al. 2009).

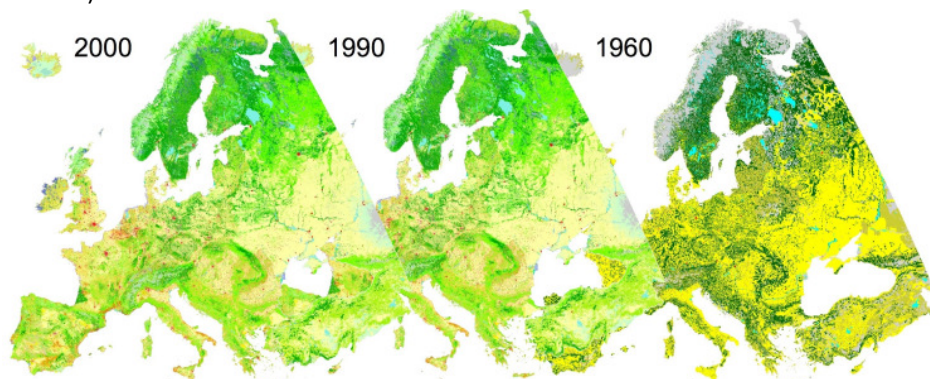


Figure 1: Three time slices of an EcoChange land cover map with a consistent legend.

¹ Land cover refers to the physical surface of earth (e.g. urban fabric, agricultural land, inland waters, bare rocks), while land use rather refers to the kind of utilization by men (e.g. urban, agriculture, grassland, forest).

Land use

The EU FP6 project ALARM has generated a series of widely used land use change scenarios based on socio-economic storylines implemented for the three ALARM scenarios. These scenarios have been downscaled (Dendoncker et al. 2006) in Activity 1 of EcoChange from a spatial resolution of ~20km to 250m for three time steps (2020, 2050, 2080, see Fig.2). While the ALARM scenarios were only available for a reduced number of European countries, the downscaled products now include all new member states plus Norway and Switzerland. Together with the baseline land use of 2000, these data sets allow for the analyses global change effects in four transitions for the ongoing 21st century. This information serves as an input for many analyses of global change impacts on biodiversity and ecosystems within EcoChange's ongoing activities.

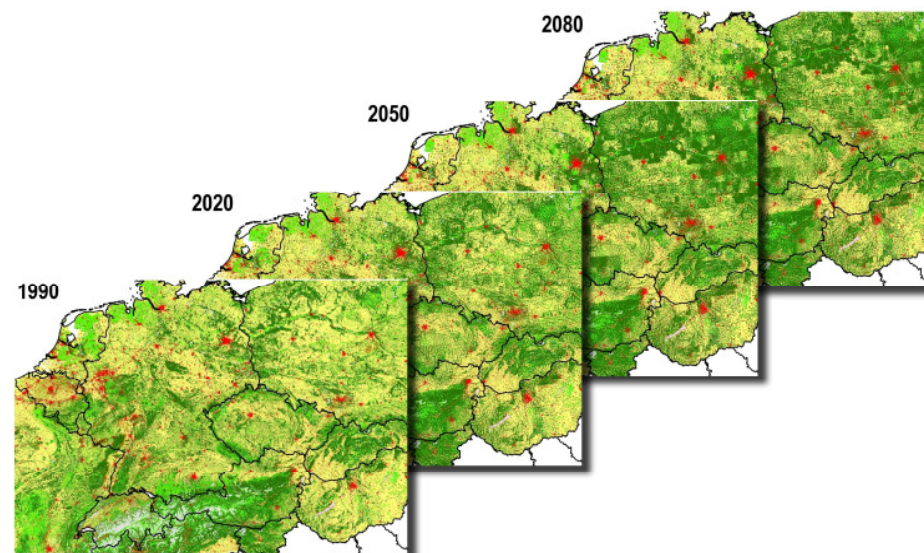


Figure 2: Three time slices of a downscaled ALARM land use change scenario for Central Europe based on the GRAS scenario (≈A1Fi), scaled from 10' to 250m.

References

- Dendoncker N, Bogaert P & Rounsevell MDA (2006). A statistical method to downscale aggregate land use data. *Journal of Land Use Science* 1(2) : 63-82.
- Mucher CA, Hennekens SM Bunce RGH Schaminée JHJ & Schaepman ME (2009). Modelling the spatial distribution of Natura 2000 habitats across Europe. *Landscape and Urban Planning* 92: 148-159.