Sample of map representation of land cover changes in two and three time horizons

*Jan Feranec, Institute of Geography, Slovak Academy of Sciences, Bratislava, Slovak Republic,
e-mail: feranec@savba.sk
Tomas Soukup, GISAT s.r.o., Prague, Czech Republic,
e-mail: tomas.soukup@gisat.cz*

The aim of this paper is to show two options of LC change representation in two and three time horizons on a single map applying the CORINE land cover (CLC) data in order to highlight the trends.

Land cover (LC) is considered one of the most dynamic phenomena of landscape. Changes can be expressed by statistics: tables and graphs which demonstrate enlargement or diminishment of individual LC classes.

Changes take place on the Earth's surface, so the most appropriate means of their representation is a map which complements the statistics.

Map representation of LC changes is accomplished in two ways:

➤ A single map representing changes between two time horizons,

➤ Small multiple maps also representing changes between two or more time horizons, and by

➤ Animation, which is a process of creating images simulating the movement first of all for temporal changes of objects and their properties, should be also mentioned here (Kraak 2014, *Mapping Time*).

Single map

Interval
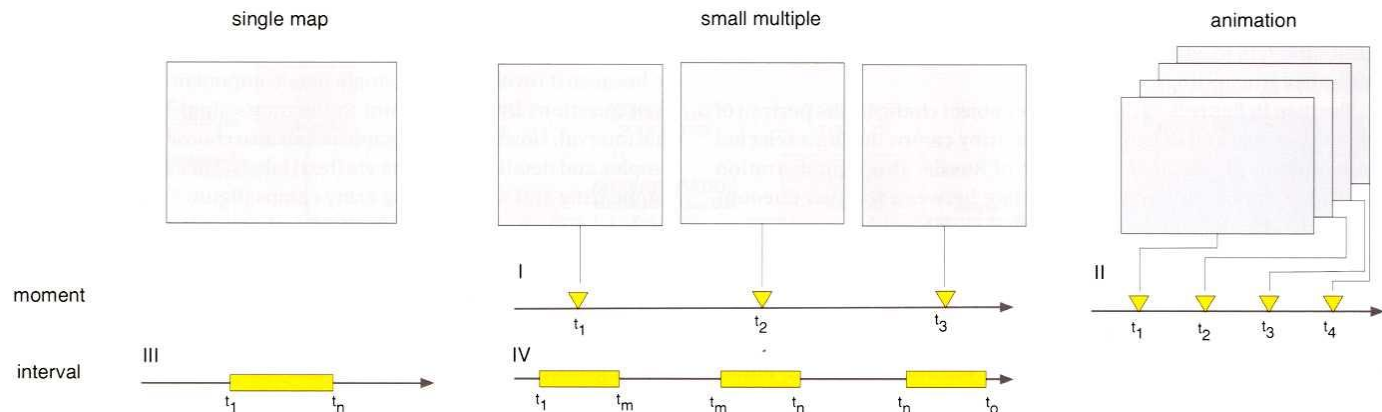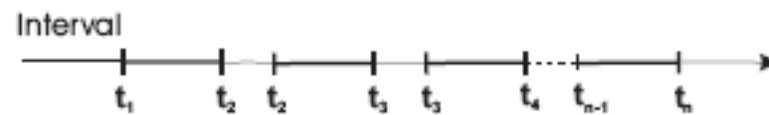
CLC change data 1990-2000, 2000-2006 and 2006-2012

Identified LC changes were associated with the process of artificial surfaces formation, which is considered part of urbanization (change of agricultural areas, forest and semi-natural areas into artificial areas) and are referred to as the LC flow urbanization (LCFU).

Two approaches were used:

➢ The first option demonstrates representation of LC changes in 1990-2000 and 2000-2006.
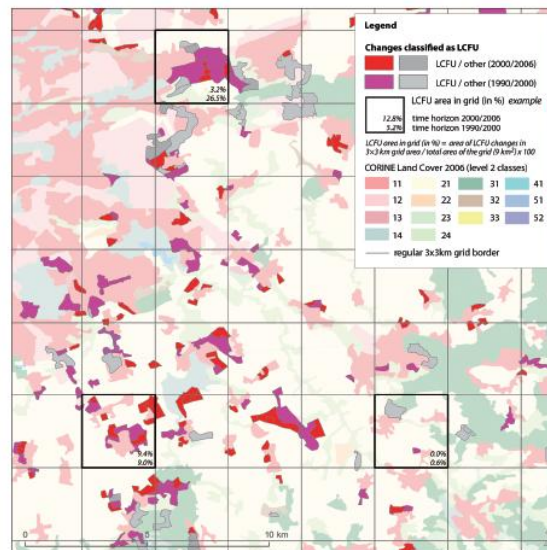

The mean LCFU value for 1990-2000 was 3.3% and 2.2% for 2000-2006.

G1 G2   LCFU above mean value → LCFU above mean value
S1 G2   LCFU below mean value → LCFU above mean value
N1 G2   Without LCFU → LCFU above mean value
S1 S2   LCFU below mean value → LCFU below mean value
N1 S2   Without LCFU → LCFU below mean value
G1 S2   LCFU above mean value → LCFU below mean value
G1 N2   LCFU above mean value → Without LCFU
S1 N2   LCFU below mean value → Without LCFU
N1 N2   Without LCFU → Without LCFU

G – greater than „mean value of LCFU"
S – smaller than „mean value of LCFU"
N – No LCFU
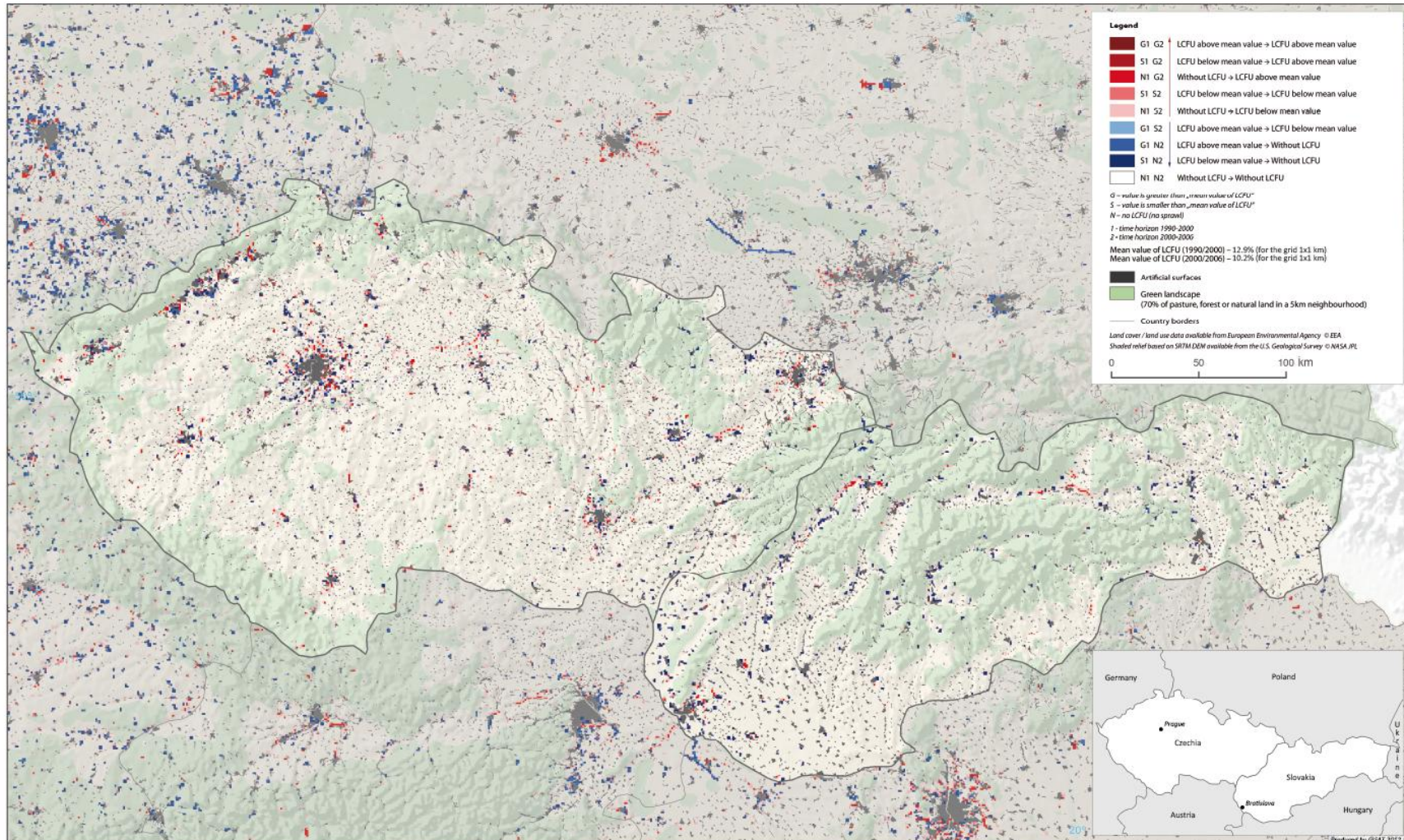
Changes of LCFU in Czechia and Slovakia in 1990-2000-2006   (Feranec & Soukup 2012).

➢ The second way demonstrates representation of LC changes in 1990-2000, 2000-2006 and 2006-2012. It is based on the comparison of sizes of real values (yearly change areas) of the appurtenant LC change type (in ha) in a 3 × 3 km square in three time horizons. The referential value is the LC change in 1990-2000. The result is spatial representation of squares where LC changes:

• enlarged (reaching greater value compared to referential value – in red);
• diminished (reaching always smaller value compared to referential value – in blue);
• reached alternating values (enlargement, diminishment and the same value compared to referential value or the change was not identified in the referred time horizon and took place in the following time horizons – in magenta).
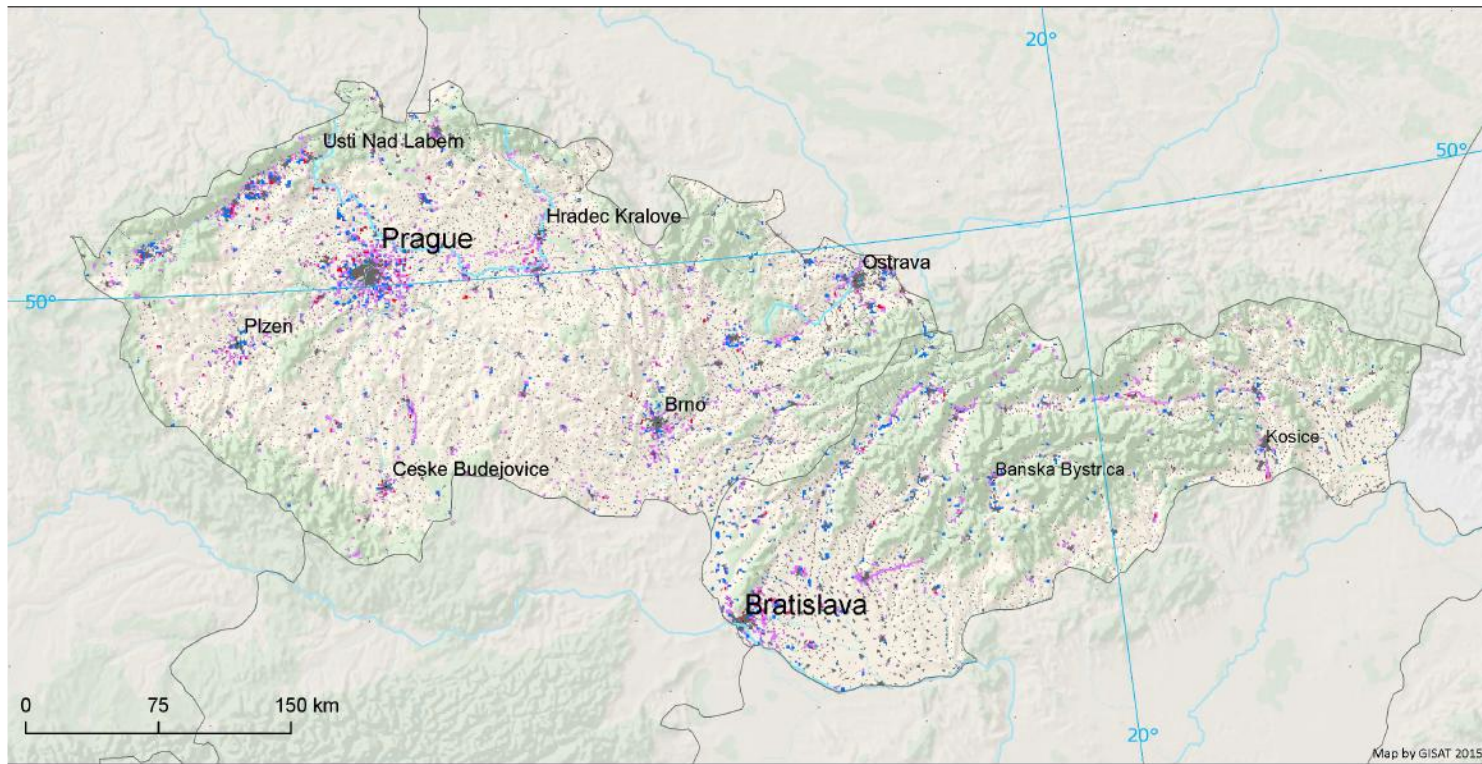
LCFU Urbanisation

Comparison of LCF intensities in periods 2000-2006 and 2006-2012
with that found in 1990-2000

🟥 **Increasing trend** (higher intensity in both periods)

🟦 **Decreasing trend** (lower intensity in both periods)

🟪 **Mixed trend** (higher intensity in one period, lower in second or the same intensity)

Map background

⬛ **Artificial surfaces**

🟩 **Green landscape**
70% of pasture, forest and natural land
in a 5 km neighbourhood

Changes of LCFU in Czechia and Slovakia in 1990-2000, 2000-2006, and 2006-2012.

This type of map representation also makes it possible to represent – illustrate changes in more than three time horizons in a single map contributing to the identification of trends in landscape dynamics.

THANK YOU FOR YOUR ATTANTION